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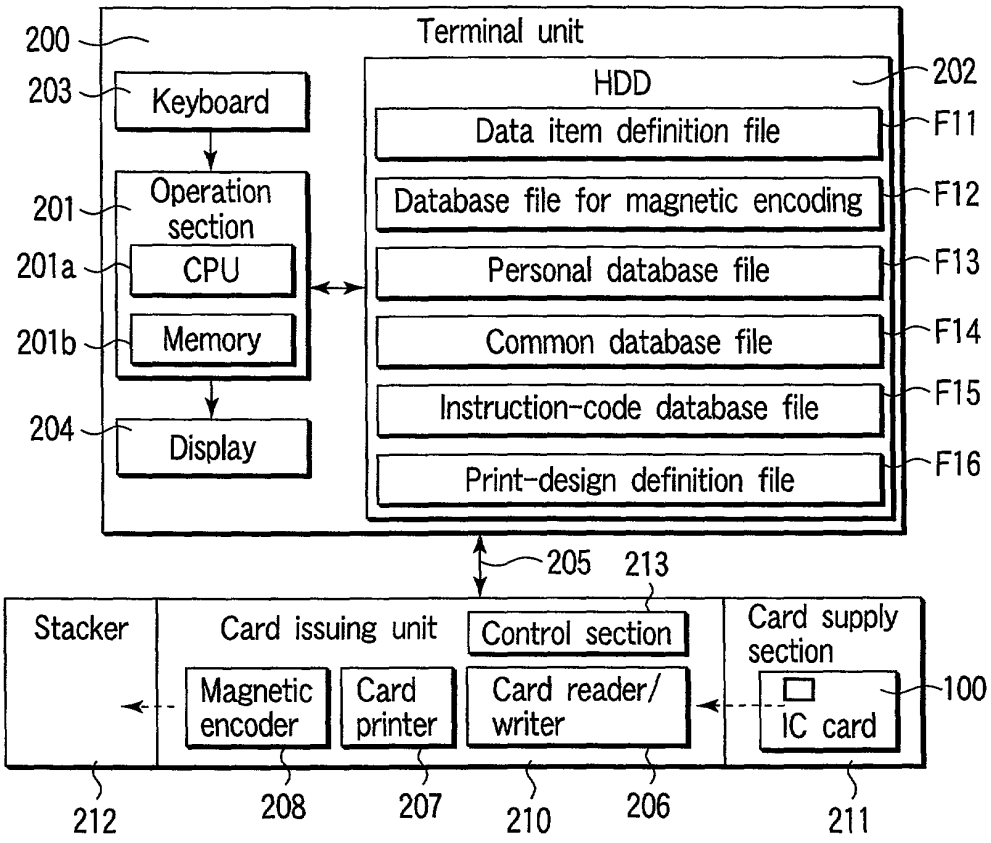


FIG. 1

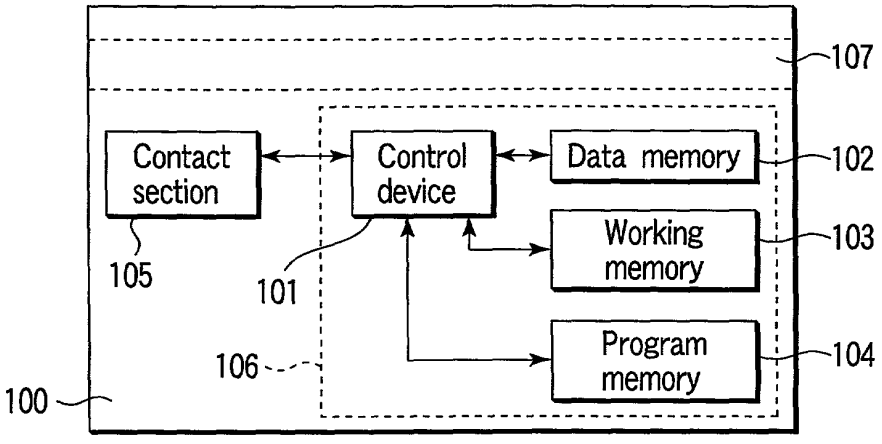


FIG. 2

FIG. 3A Format 1

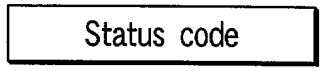
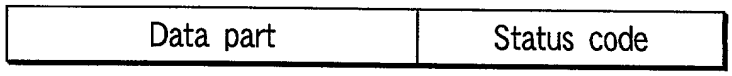


FIG. 3B Format 2



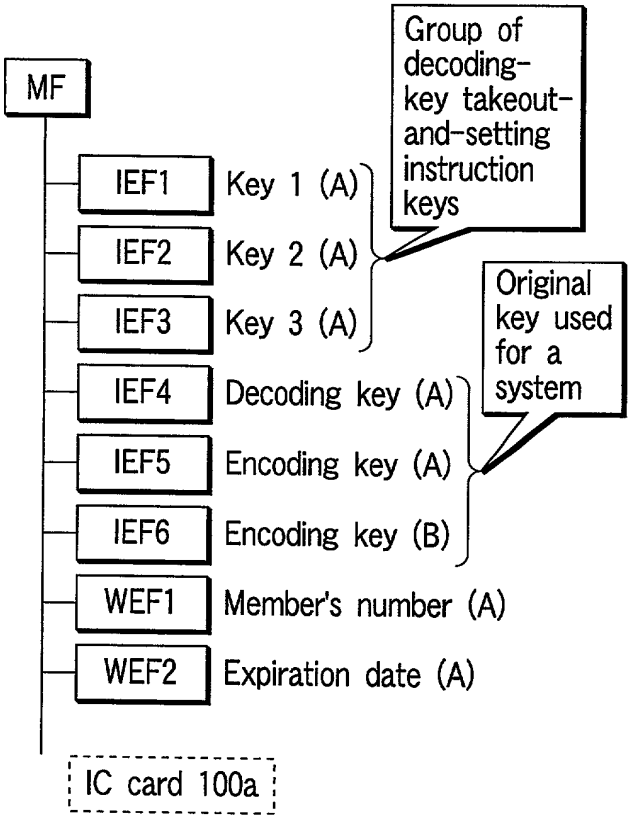


FIG. 4A

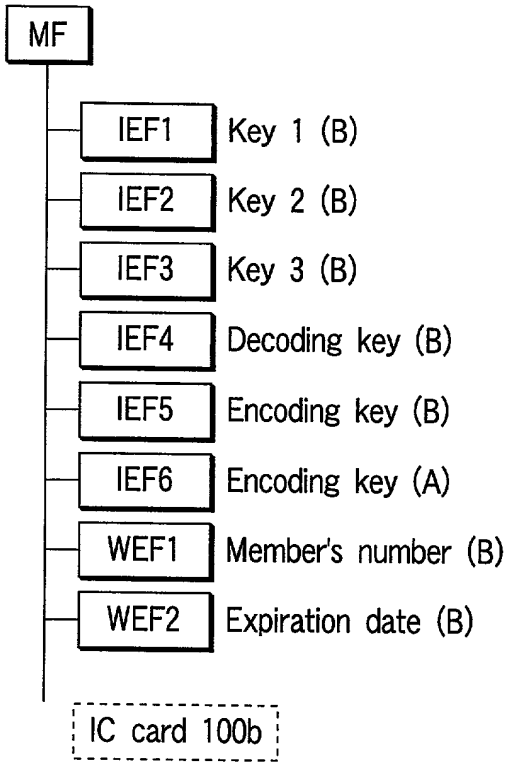


FIG. 4B

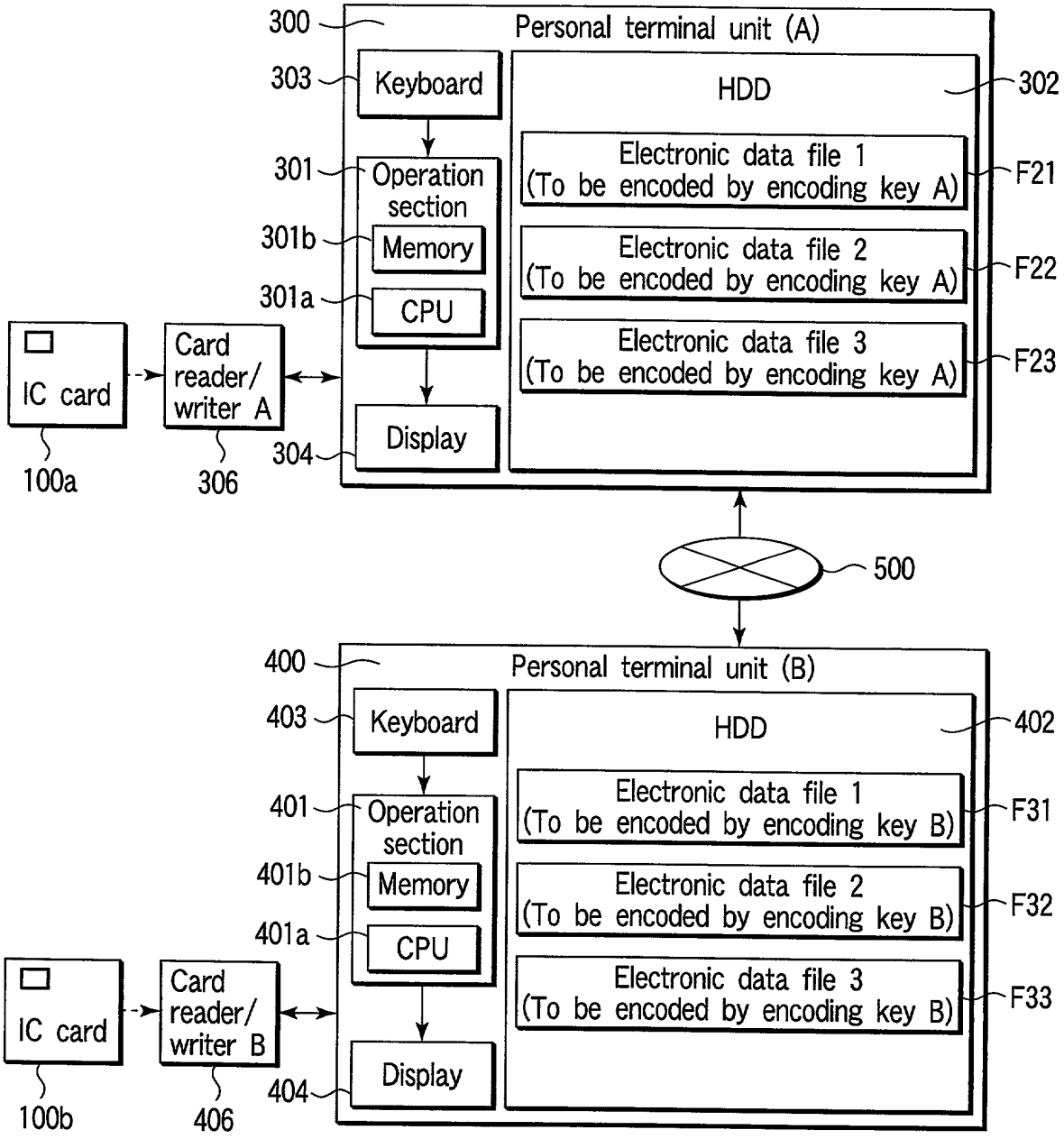

300
Personal terminal unit (A)
303
Keyboard
HDD
302
301
Operation section
Electronic data file 1 (To be encoded by encoding key A)
F21
301b
Memory
Electronic data file 2 (To be encoded by encoding key A)
F22
301a
CPU
Electronic data file 3 (To be encoded by encoding key A)
F23
IC card
Card reader/ writer A
Display
304
100a
306
500
400
Personal terminal unit (B)
403
Keyboard
HDD
402
401
Operation section
Electronic data file 1 (To be encoded by encoding key B)
F31
401b
Memory
Electronic data file 2 (To be encoded by encoding key B)
F32
401a
CPU
Electronic data file 3 (To be encoded by encoding key B)
F33
IC card
Card reader/ writer B
Display
404
100b
406

FIG. 5

	Item 1 : kanji name	Item 2 : kanji address	Item 4 : Member's number	Item 5 : Expiration date	Item 6 : Password	Item 7 : Key 1
Record #1	Taro Tanaka	Nerima - ku	000007	2000.09	737c54a87	93 24..d8 88 AB
Record #2	Jiro Suzuki	Koto - ku	000014	2001.10	4787ea7184	d0 93..b2 cb 46
⋮	⋮	⋮	⋮	⋮	⋮	⋮
⋮	⋮	⋮	⋮	⋮	⋮	⋮
Record #13	Saburo Hayashi	Shinjuku - ku	000157	2005.08	c8d7eb567f	82 6a..eb 0b 87
Record #14	Shiro Matsumoto	Suginami - ku	000004	2002.07	8181fc35d8	49 83..6c 44 78
⋮	⋮	⋮	⋮	⋮	⋮	⋮
⋮	⋮	⋮	⋮	⋮	⋮	⋮
Record #21	Goro Nakamura	Shinagawa - ku	002004	2000.12	eefaac5620	35 89..fb f9 90

FIG. 6

	Contents of instruction code	Additional data	IC output information
Instruction code 1	Contents of instruction code 1	X	90 00
Instruction code 2	Contents of instruction code 2	X	90 00
⋮	⋮	⋮	⋮
Instruction code 18	Contents of instruction code 18	Personal file : Item 6	90 00
Instruction code 19	Contents of instruction code 19	Personal file : Item 7	90 00
Instruction code 20	Contents of instruction code 20	X	90 00
⋮	⋮	⋮	
Instruction code 25	Contents of instruction code 25	Personal file : Item 5	90 00
⋮	⋮	⋮	
Instruction code 30	Contents of instruction code 30	X	90 00
Instruction code 31	Contents of instruction code 31	X	90 00
⋮	⋮	⋮	

FIG. 7

	Contents of instruction code	Additional data	IC output information
Instruction code 1	Contents of instruction code 1	X	90 00
Instruction code 2	Contents of instruction code 2	X	90 00
⋮	⋮	⋮	⋮
Instruction code 18	Contents of instruction code 18	Personal file : Item 6	90 00
Instruction code 19	Contents of instruction code 19	Personal file : Item 7	90 00

FIG. 8

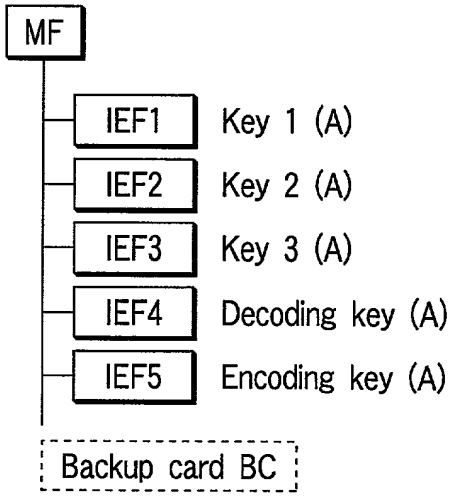


FIG. 9

	Additional data
Contents of instruction code 19	49 83..6c 44 78

FIG. 10

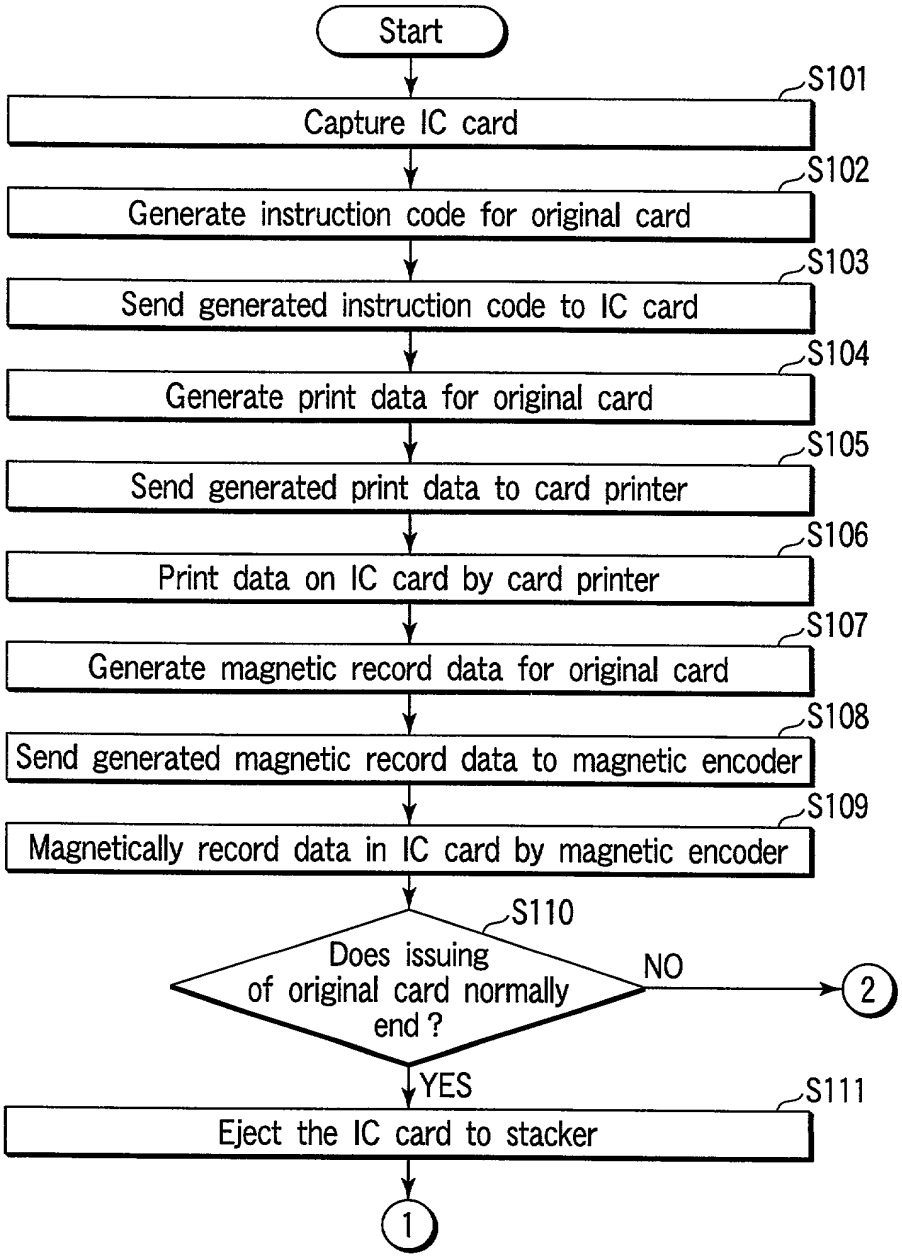

Start
S101
Capture IC card
S102
Generate instruction code for original card
S103
Send generated instruction code to IC card
S104
Generate print data for original card
S105
Send generated print data to card printer
S106
Print data on IC card by card printer
S107
Generate magnetic record data for original card
S108
Send generated magnetic record data to magnetic encoder
S109
Magnetically record data in IC card by magnetic encoder
S110
Does issuing of original card normally end ?
NO
2
YES
S111
Eject the IC card to stacker
1

FIG. 11A

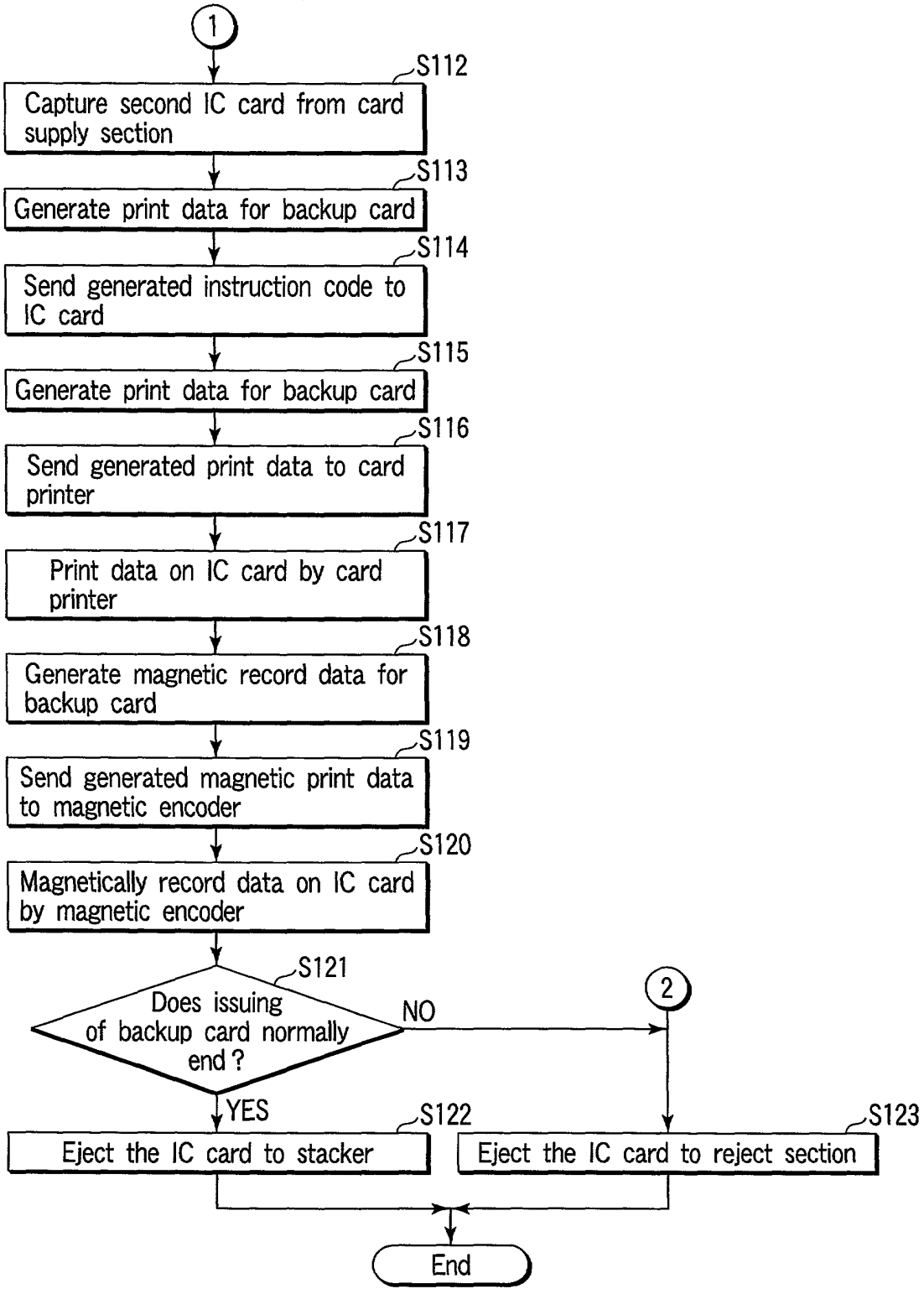

1
S112
Capture second IC card from card supply section
S113
Generate print data for backup card
S114
Send generated instruction code to IC card
S115
Generate print data for backup card
S116
Send generated print data to card printer
S117
Print data on IC card by card printer
S118
Generate magnetic record data for backup card
S119
Send generated magnetic print data to magnetic encoder
S120
Magnetically record data on IC card by magnetic encoder
S121
Does issuing of backup card normally end ?
NO
2
YES
S122
Eject the IC card to stacker
S123
Eject the IC card to reject section
End

FIG. 11B

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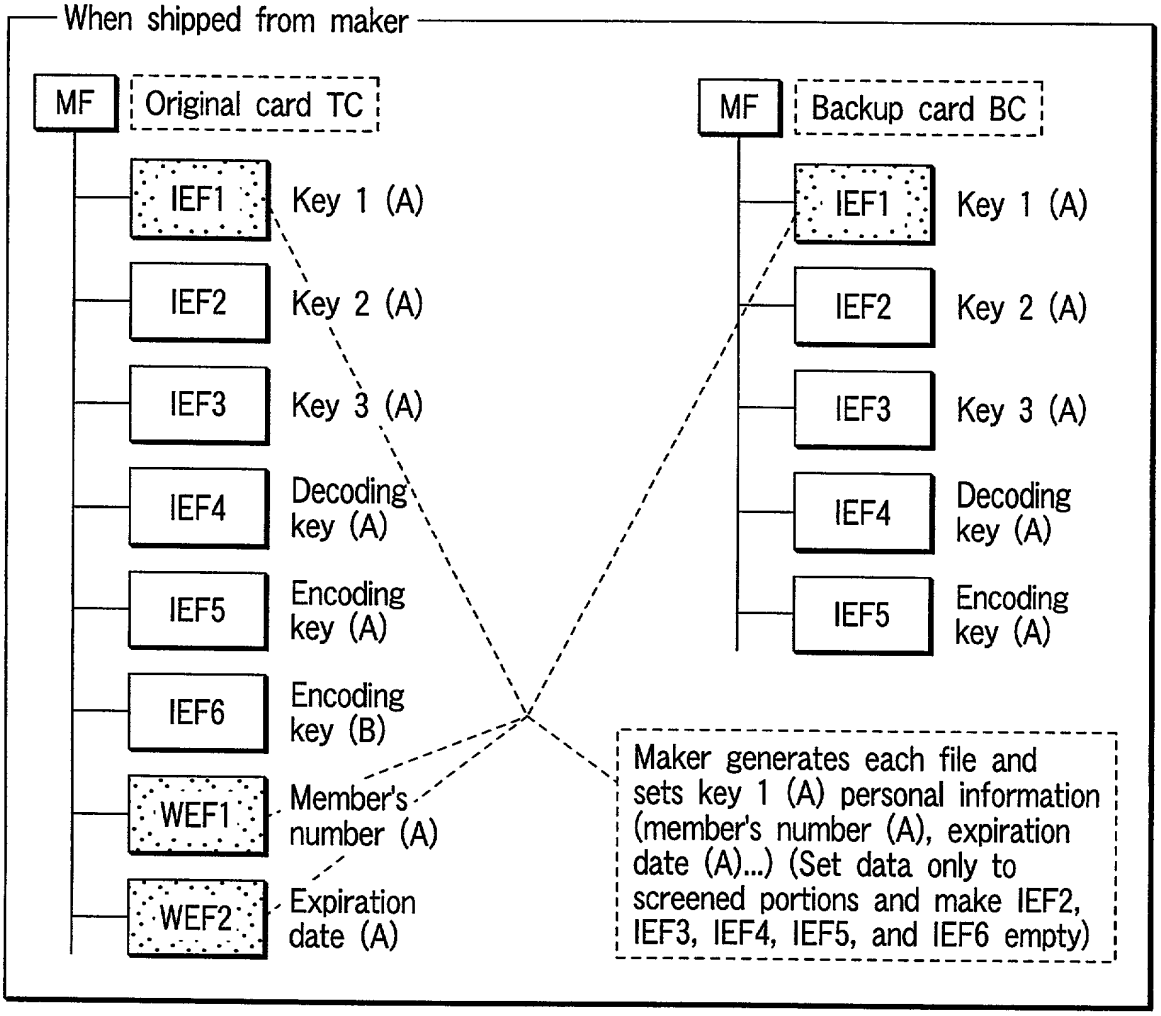

FIG. 12

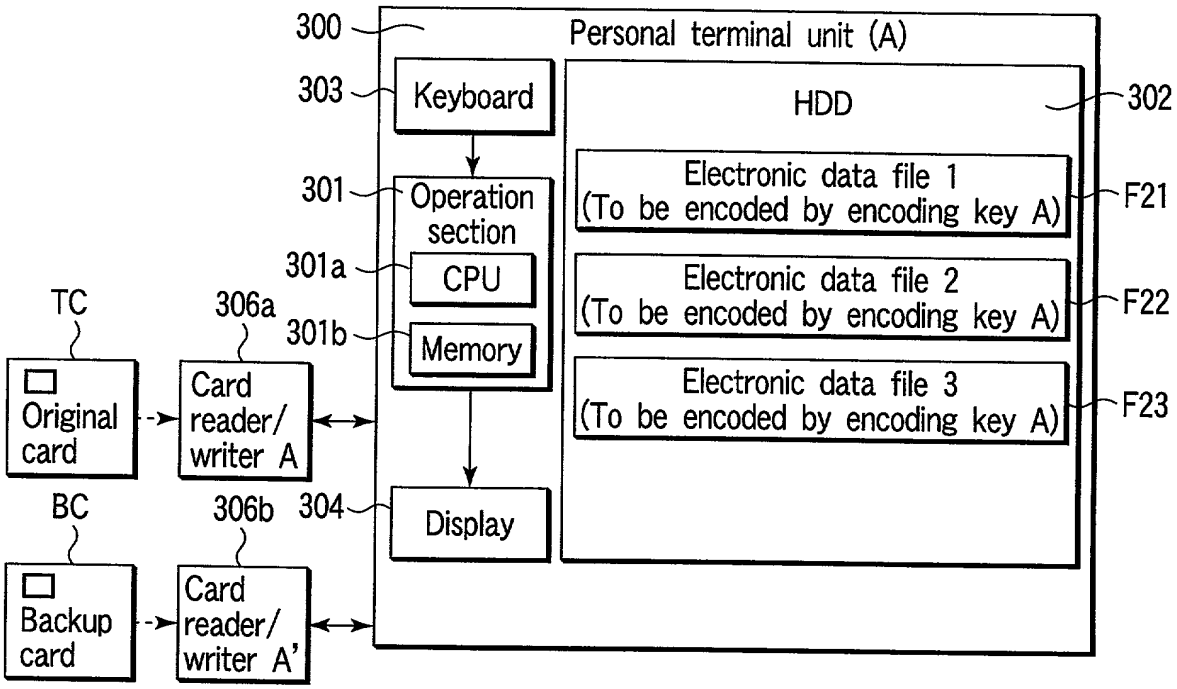
300
Personal terminal unit (A)
303
Keyboard
HDD
302
301
Operation section
Electronic data file 1
(To be encoded by encoding key A)
F21
301a
CPU
Electronic data file 2
(To be encoded by encoding key A)
F22
TC
306a
301b
Memory
Electronic data file 3
(To be encoded by encoding key A)
F23
Original card
Card reader/ writer A
BC
306b
304
Display
Backup card
Card reader/ writer A'

FIG. 13

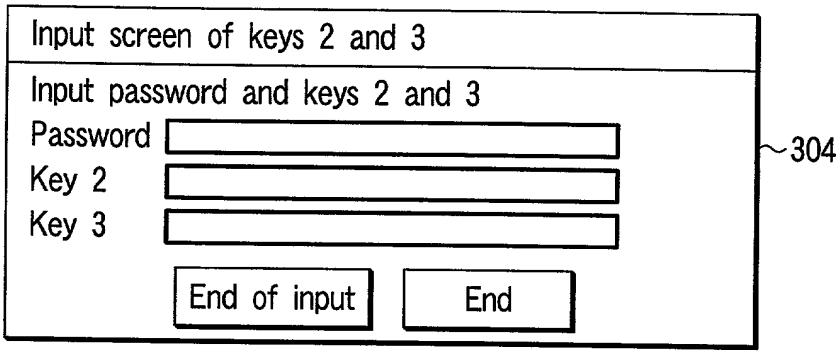
Input screen of keys 2 and 3
Input password and keys 2 and 3
Password
Key 2
Key 3
End of input
End
304

FIG. 14

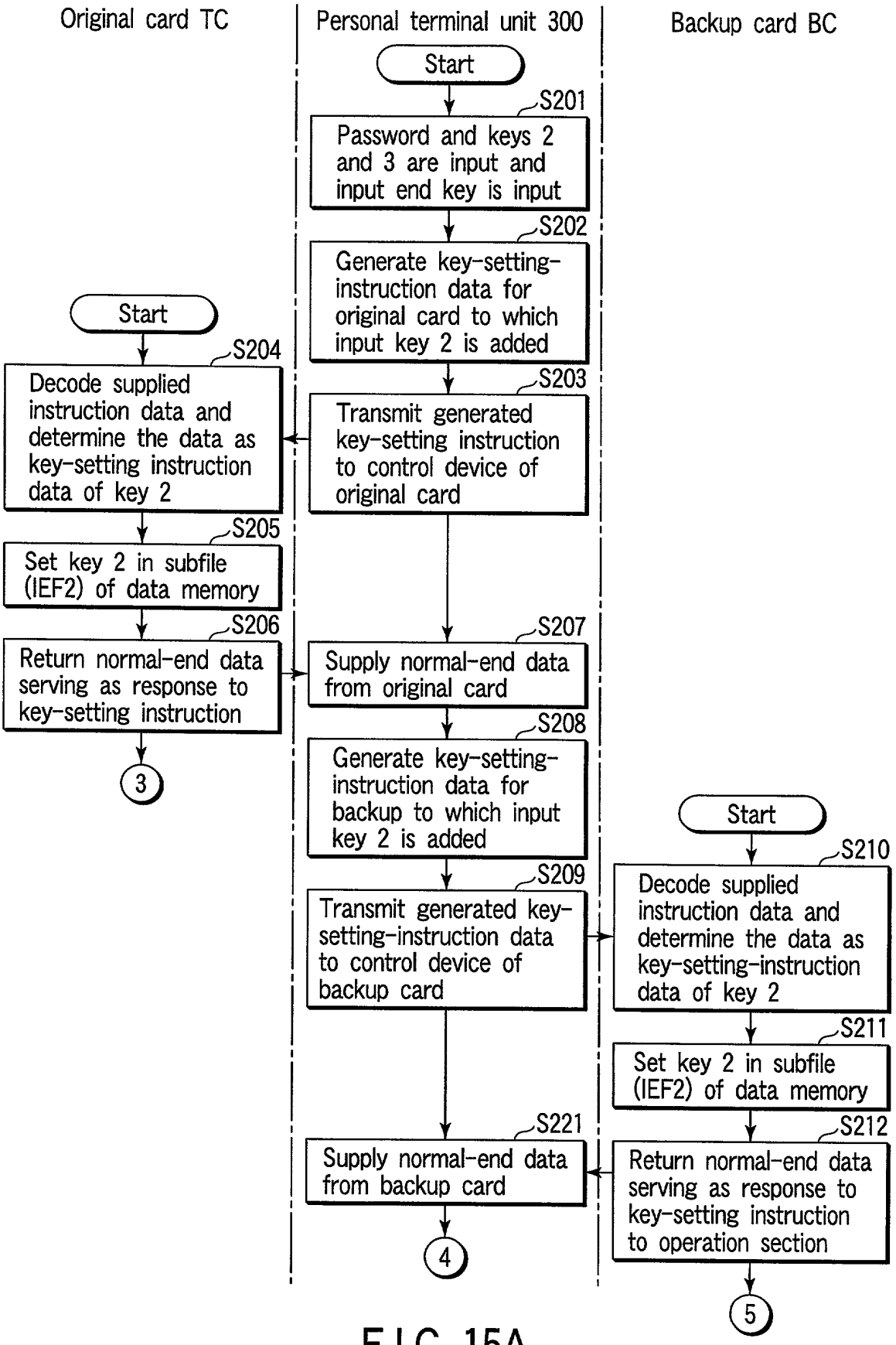
Original card TC
Personal terminal unit 300
Backup card BC
Start
S201
Password and keys 2 and 3 are input and input end key is input
S202
Generate key-setting-instruction data for original card to which input key 2 is added
S203
Transmit generated key-setting instruction to control device of original card
Start
S204
Decode supplied instruction data and determine the data as key-setting instruction data of key 2
S205
Set key 2 in subfile (IEF2) of data memory
S206
Return normal-end data serving as response to key-setting instruction
3
S207
Supply normal-end data from original card
S208
Generate key-setting-instruction data for backup to which input key 2 is added
S209
Transmit generated key-setting-instruction data to control device of backup card
Start
S210
Decode supplied instruction data and determine the data as key-setting-instruction data of key 2
S211
Set key 2 in subfile (IEF2) of data memory
S212
Return normal-end data serving as response to key-setting instruction to operation section
5
S221
Supply normal-end data from backup card
4

FIG. 15A

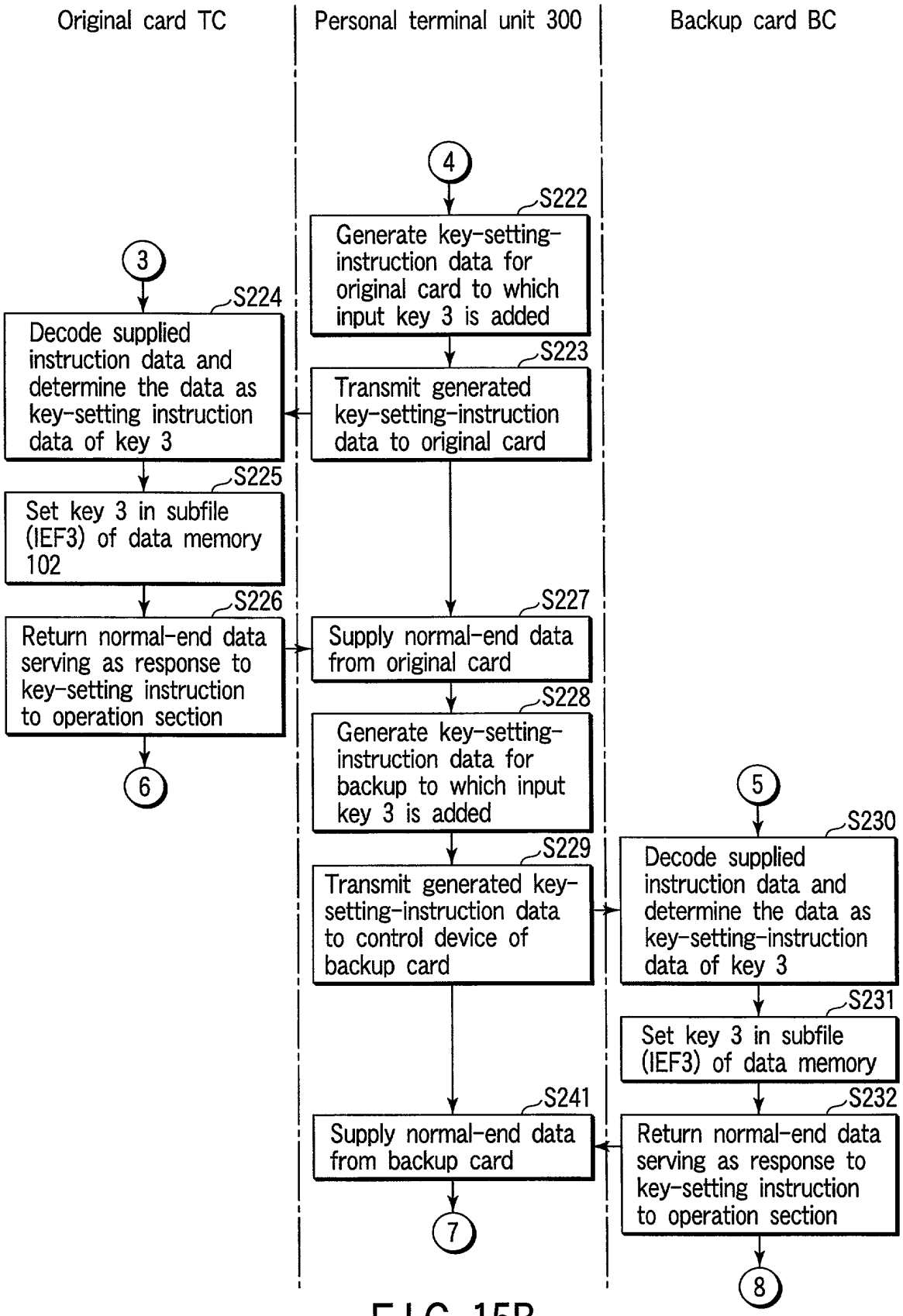
Original card TC
Personal terminal unit 300
Backup card BC
4
S222
Generate key-setting-instruction data for original card to which input key 3 is added
S223
Transmit generated key-setting-instruction data to original card
3
S224
Decode supplied instruction data and determine the data as key-setting instruction data of key 3
S225
Set key 3 in subfile (IEF3) of data memory 102
S226
Return normal-end data serving as response to key-setting instruction to operation section
6
S227
Supply normal-end data from original card
S228
Generate key-setting-instruction data for backup to which input key 3 is added
S229
Transmit generated key-setting-instruction data to control device of backup card
5
S230
Decode supplied instruction data and determine the data as key-setting-instruction data of key 3
S231
Set key 3 in subfile (IEF3) of data memory
S232
Return normal-end data serving as response to key-setting instruction to operation section
8
S241
Supply normal-end data from backup card
7

FIG. 15B

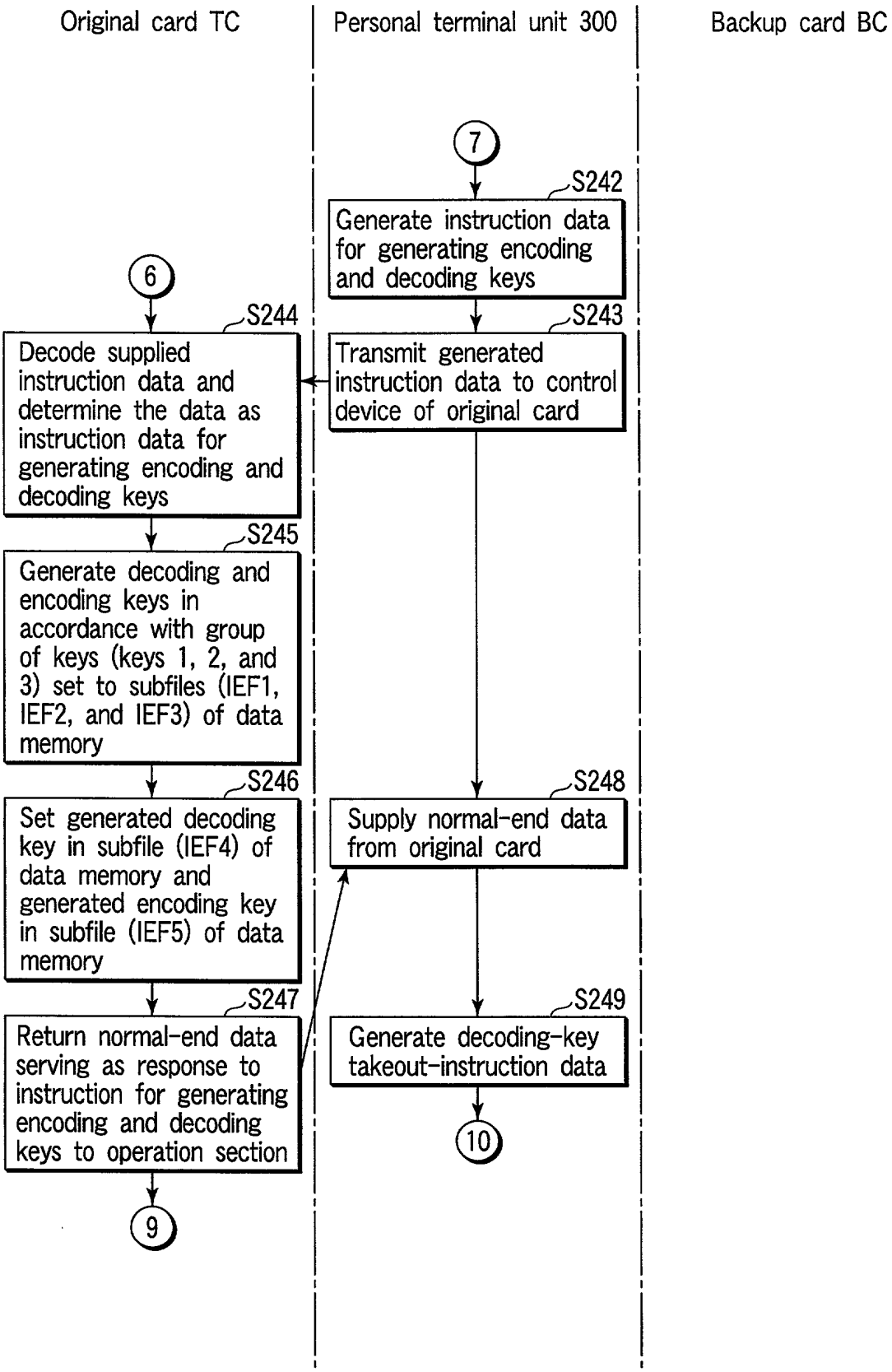
Original card TC
Personal terminal unit 300
Backup card BC
7
S242
Generate instruction data for generating encoding and decoding keys
S243
Transmit generated instruction data to control device of original card
6
S244
Decode supplied instruction data and determine the data as instruction data for generating encoding and decoding keys
S245
Generate decoding and encoding keys in accordance with group of keys (keys 1, 2, and 3) set to subfiles (IEF1, IEF2, and IEF3) of data memory
S246
Set generated decoding key in subfile (IEF4) of data memory and generated encoding key in subfile (IEF5) of data memory
S247
Return normal-end data serving as response to instruction for generating encoding and decoding keys to operation section
9
S248
Supply normal-end data from original card
S249
Generate decoding-key takeout-instruction data
10

FIG. 15C

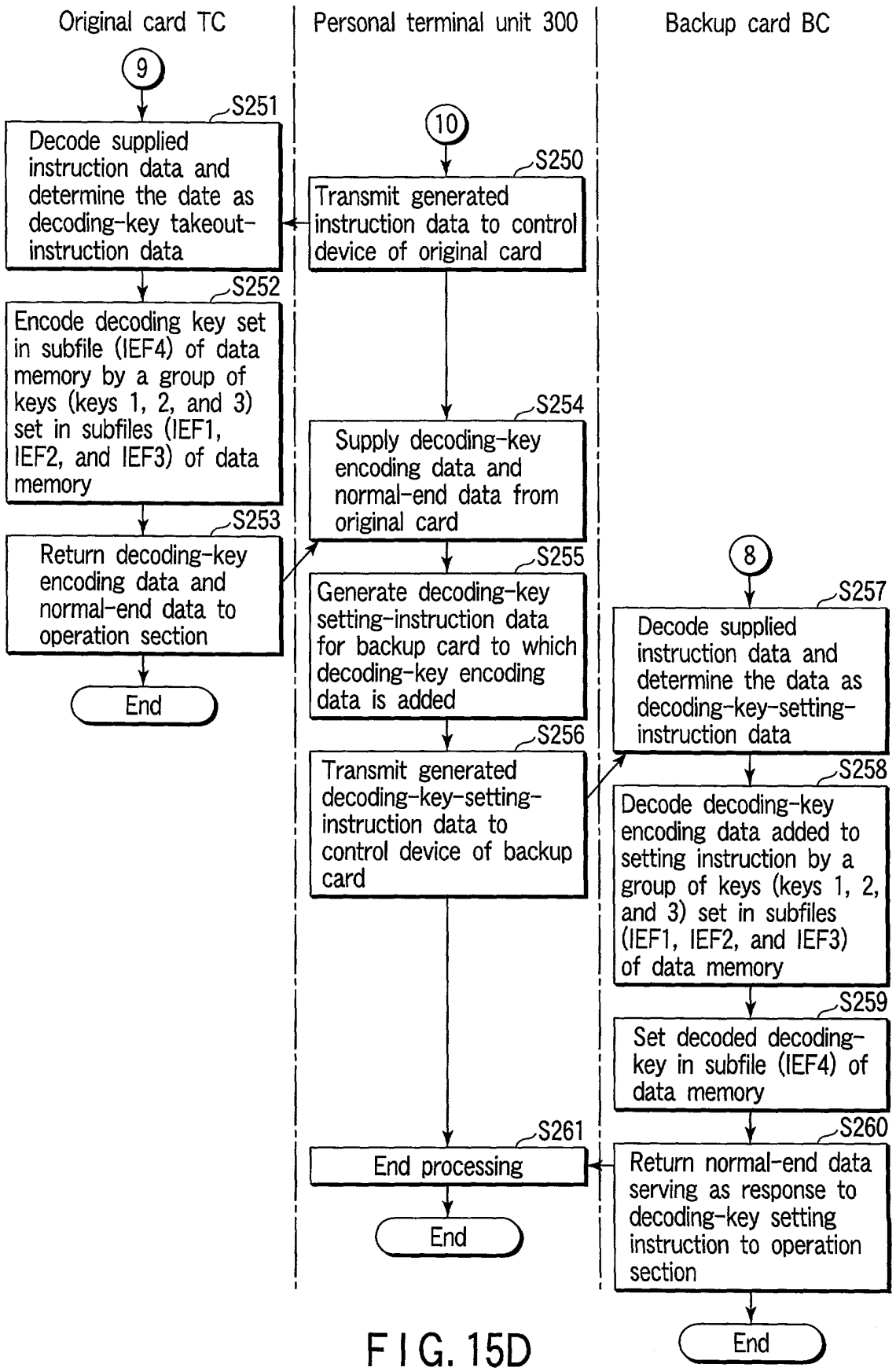
Original card TC
Personal terminal unit 300
Backup card BC
9
S251
Decode supplied instruction data and determine the date as decoding-key takeout-instruction data
S252
Encode decoding key set in subfile (IEF4) of data memory by a group of keys (keys 1, 2, and 3) set in subfiles (IEF1, IEF2, and IEF3) of data memory
S253
Return decoding-key encoding data and normal-end data to operation section
End
10
S250
Transmit generated instruction data to control device of original card
S254
Supply decoding-key encoding data and normal-end data from original card
S255
Generate decoding-key setting-instruction data for backup card to which decoding-key encoding data is added
S256
Transmit generated decoding-key-setting-instruction data to control device of backup card
S261
End processing
End
8
S257
Decode supplied instruction data and determine the data as decoding-key-setting-instruction data
S258
Decode decoding-key encoding data added to setting instruction by a group of keys (keys 1, 2, and 3) set in subfiles (IEF1, IEF2, and IEF3) of data memory
S259
Set decoded decoding-key in subfile (IEF4) of data memory
S260
Return normal-end data serving as response to decoding-key setting instruction to operation section
End

FIG. 15D

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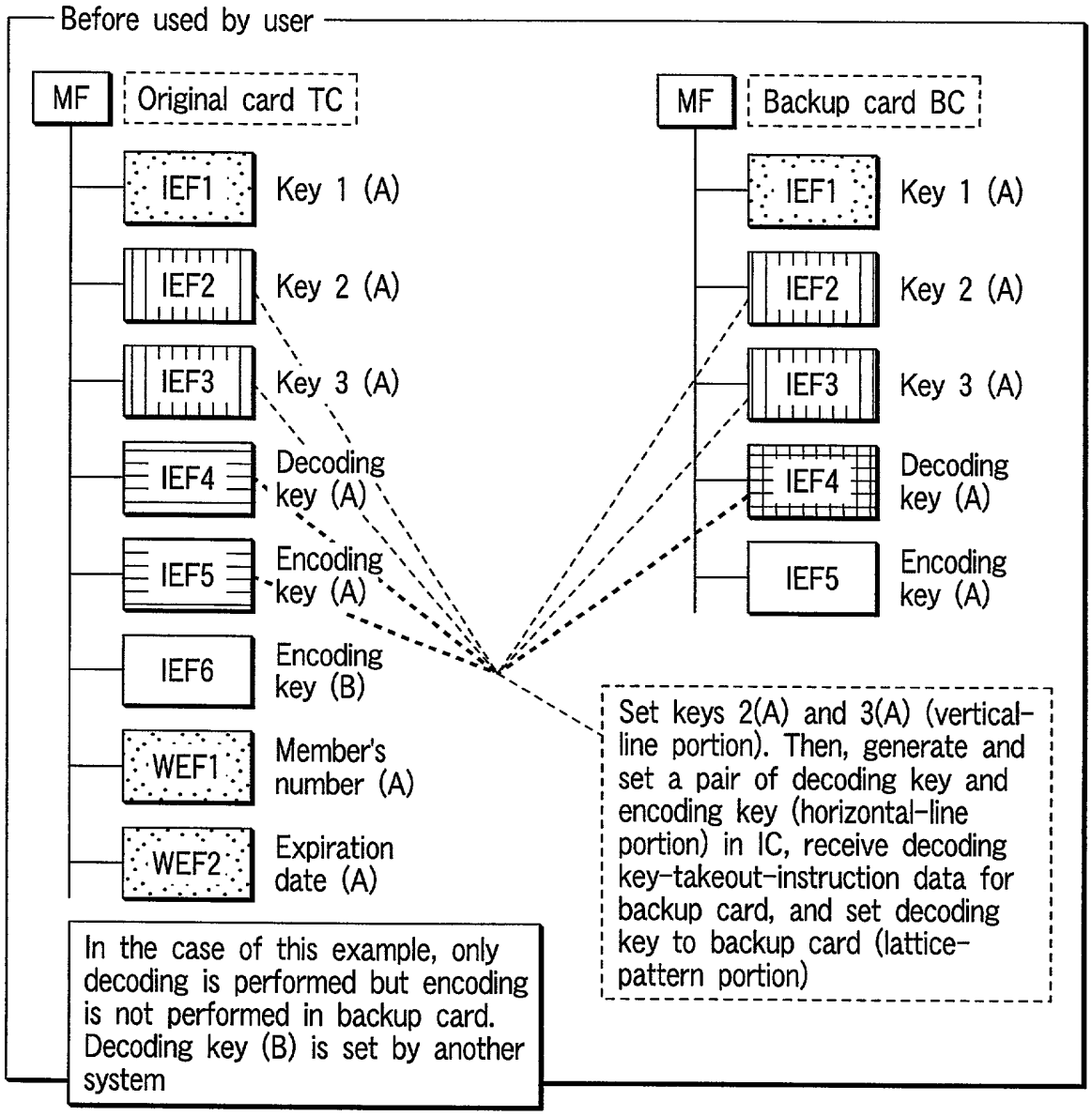

FIG. 16

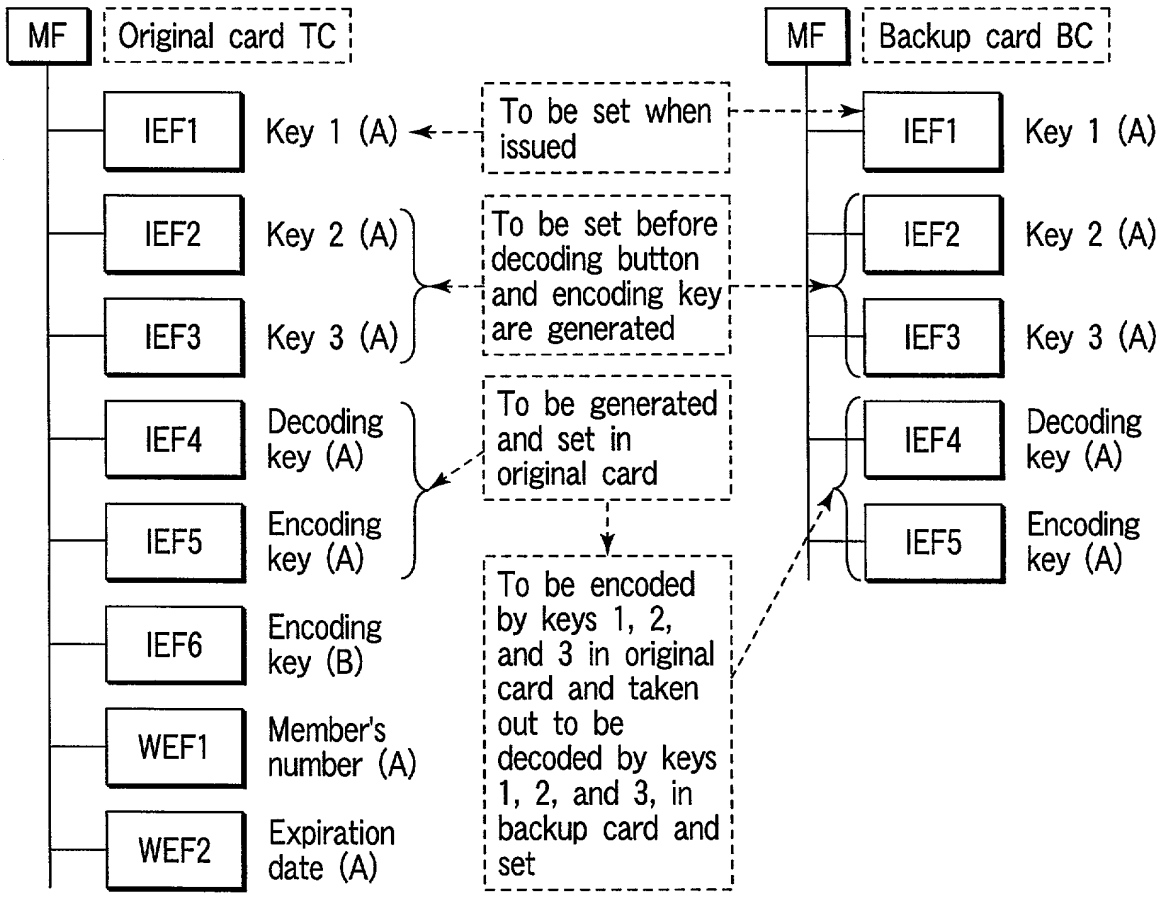
MF
Original card TC
IEF1
Key 1 (A)
IEF2
Key 2 (A)
IEF3
Key 3 (A)
IEF4
Decoding key (A)
IEF5
Encoding key (A)
IEF6
Encoding key (B)
WEF1
Member's number (A)
WEF2
Expiration date (A)
To be set when issued
To be set before decoding button and encoding key are generated
To be generated and set in original card
To be encoded by keys 1, 2, and 3 in original card and taken out to be decoded by keys 1, 2, and 3, in backup card and set
MF
Backup card BC
IEF1
Key 1 (A)
IEF2
Key 2 (A)
IEF3
Key 3 (A)
IEF4
Decoding key (A)
IEF5
Encoding key (A)

FIG. 17

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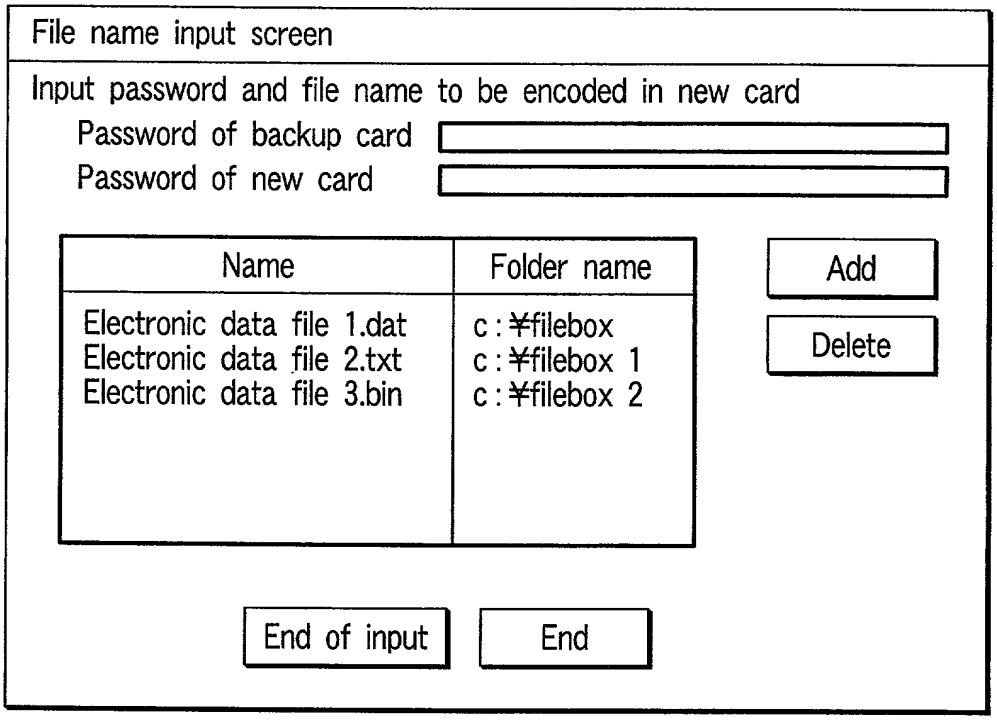

FIG. 18

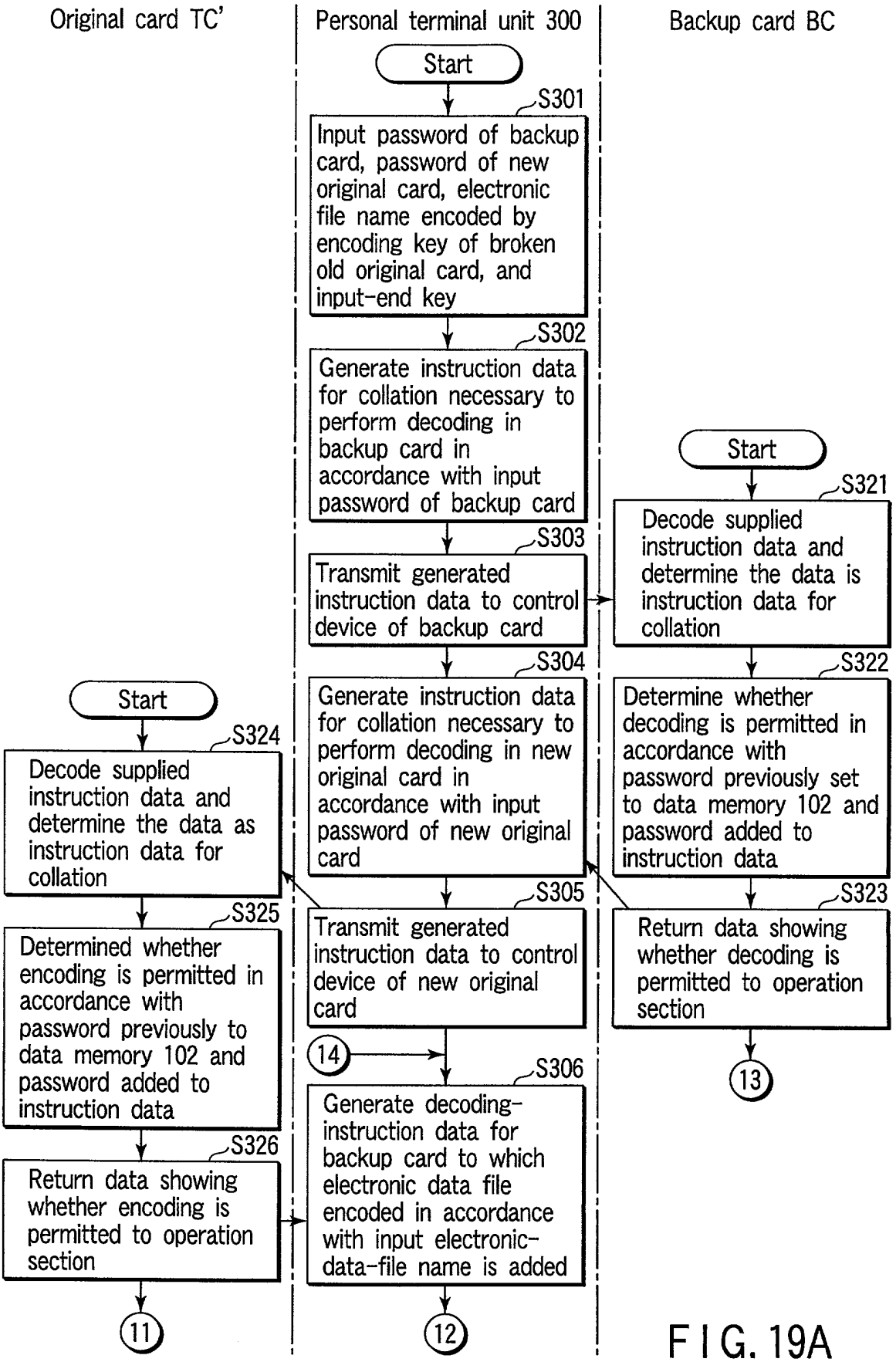
Original card TC'
Personal terminal unit 300
Backup card BC
Start
S301
Input password of backup card, password of new original card, electronic file name encoded by encoding key of broken old original card, and input-end key
S302
Generate instruction data for collation necessary to perform decoding in backup card in accordance with input password of backup card
S303
Transmit generated instruction data to control device of backup card
S304
Generate instruction data for collation necessary to perform decoding in new original card in accordance with input password of new original card
S305
Transmit generated instruction data to control device of new original card
14
S306
Generate decoding-instruction data for backup card to which electronic data file encoded in accordance with input electronic-data-file name is added
12
Start
S321
Decode supplied instruction data and determine the data is instruction data for collation
S322
Determine whether decoding is permitted in accordance with password previously set to data memory 102 and password added to instruction data
S323
Return data showing whether decoding is permitted to operation section
13
Start
S324
Decode supplied instruction data and determine the data as instruction data for collation
S325
Determined whether encoding is permitted in accordance with password previously to data memory 102 and password added to instruction data
S326
Return data showing whether encoding is permitted to operation section
11

FIG. 19A

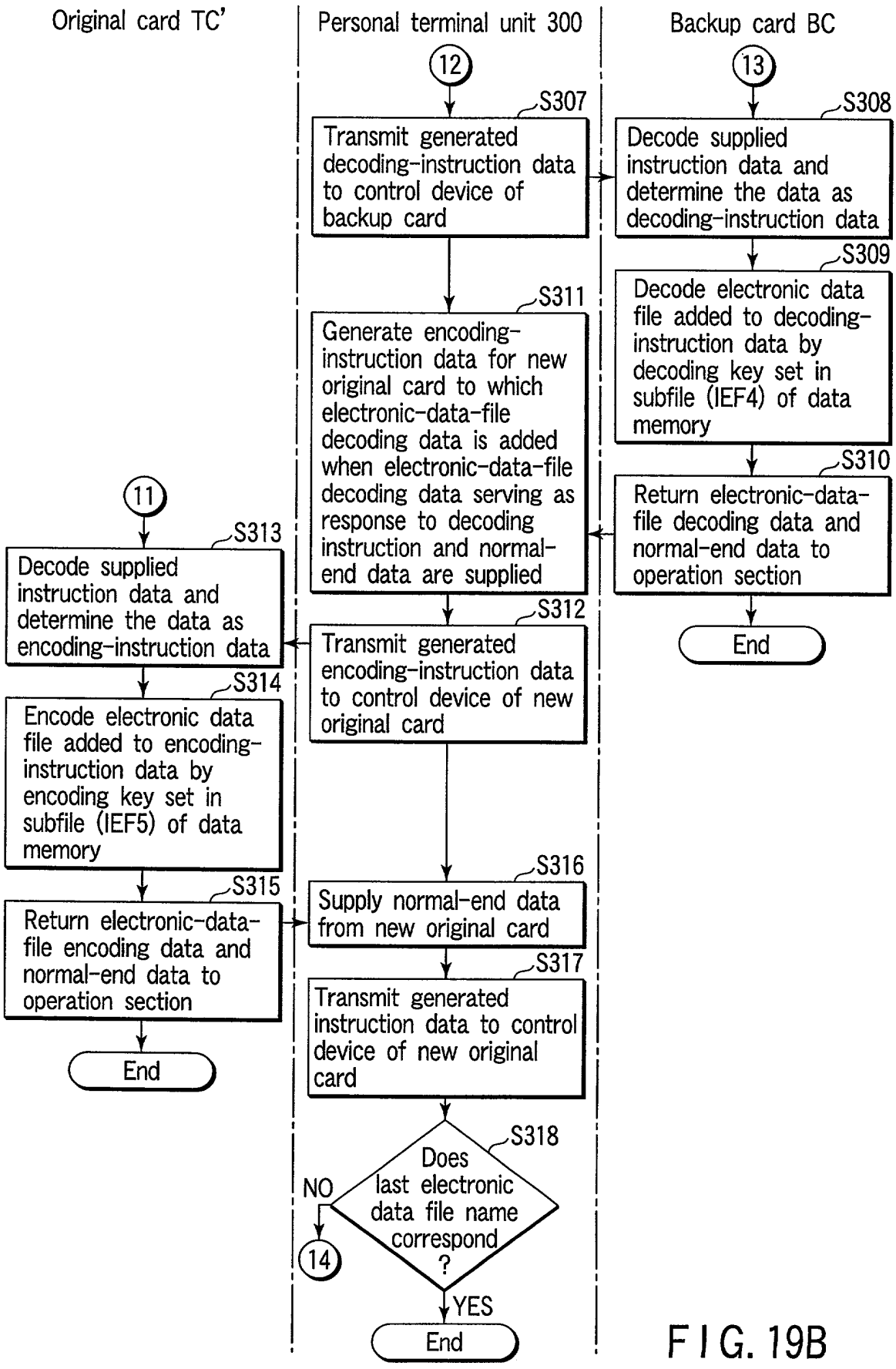
Original card TC'
Personal terminal unit 300
Backup card BC
12
13
S307
Transmit generated decoding-instruction data to control device of backup card
S308
Decode supplied instruction data and determine the data as decoding-instruction data
S309
Decode electronic data file added to decoding-instruction data by decoding key set in subfile (IEF4) of data memory
S310
Return electronic-data-file decoding data and normal-end data to operation section
End
S311
Generate encoding-instruction data for new original card to which electronic-data-file decoding data is added when electronic-data-file decoding data serving as response to decoding instruction and normal-end data are supplied
S312
Transmit generated encoding-instruction data to control device of new original card
11
S313
Decode supplied instruction data and determine the data as encoding-instruction data
S314
Encode electronic data file added to encoding-instruction data by encoding key set in subfile (IEF5) of data memory
S315
Return electronic-data-file encoding data and normal-end data to operation section
End
S316
Supply normal-end data from new original card
S317
Transmit generated instruction data to control device of new original card
S318
Does last electronic data file name correspond ?
NO
14
YES
End

FIG. 19B

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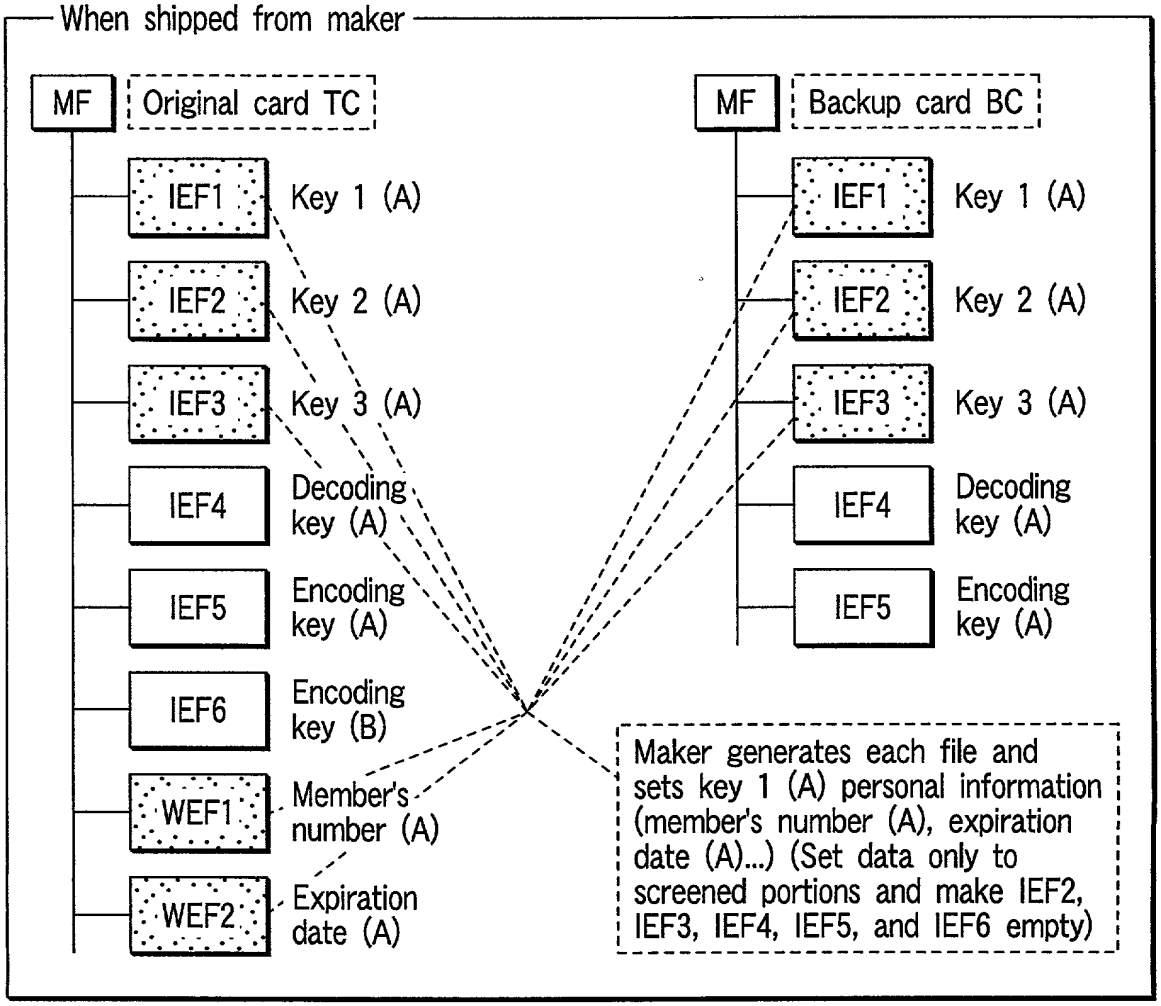

FIG. 20

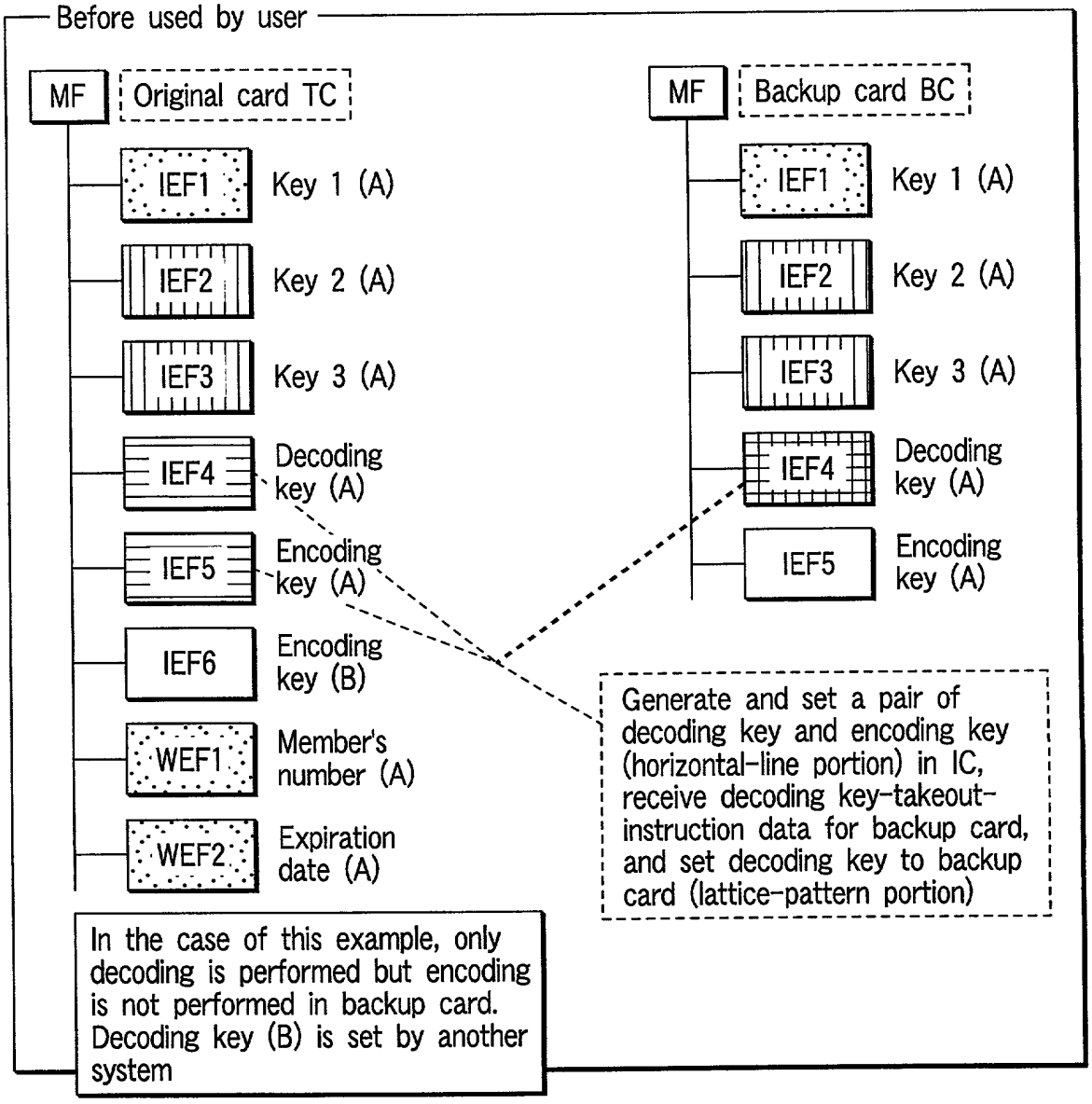
Before used by user
MF
Original card TC
IEF1
Key 1 (A)
IEF2
Key 2 (A)
IEF3
Key 3 (A)
IEF4
Decoding key (A)
IEF5
Encoding key (A)
IEF6
Encoding key (B)
WEF1
Member's number (A)
WEF2
Expiration date (A)
MF
Backup card BC
IEF1
Key 1 (A)
IEF2
Key 2 (A)
IEF3
Key 3 (A)
IEF4
Decoding key (A)
IEF5
Encoding key (A)
Generate and set a pair of decoding key and encoding key (horizontal-line portion) in IC, receive decoding key-takeout-instruction data for backup card, and set decoding key to backup card (lattice-pattern portion)
In the case of this example, only decoding is performed but encoding is not performed in backup card. Decoding key (B) is set by another system

FIG. 21

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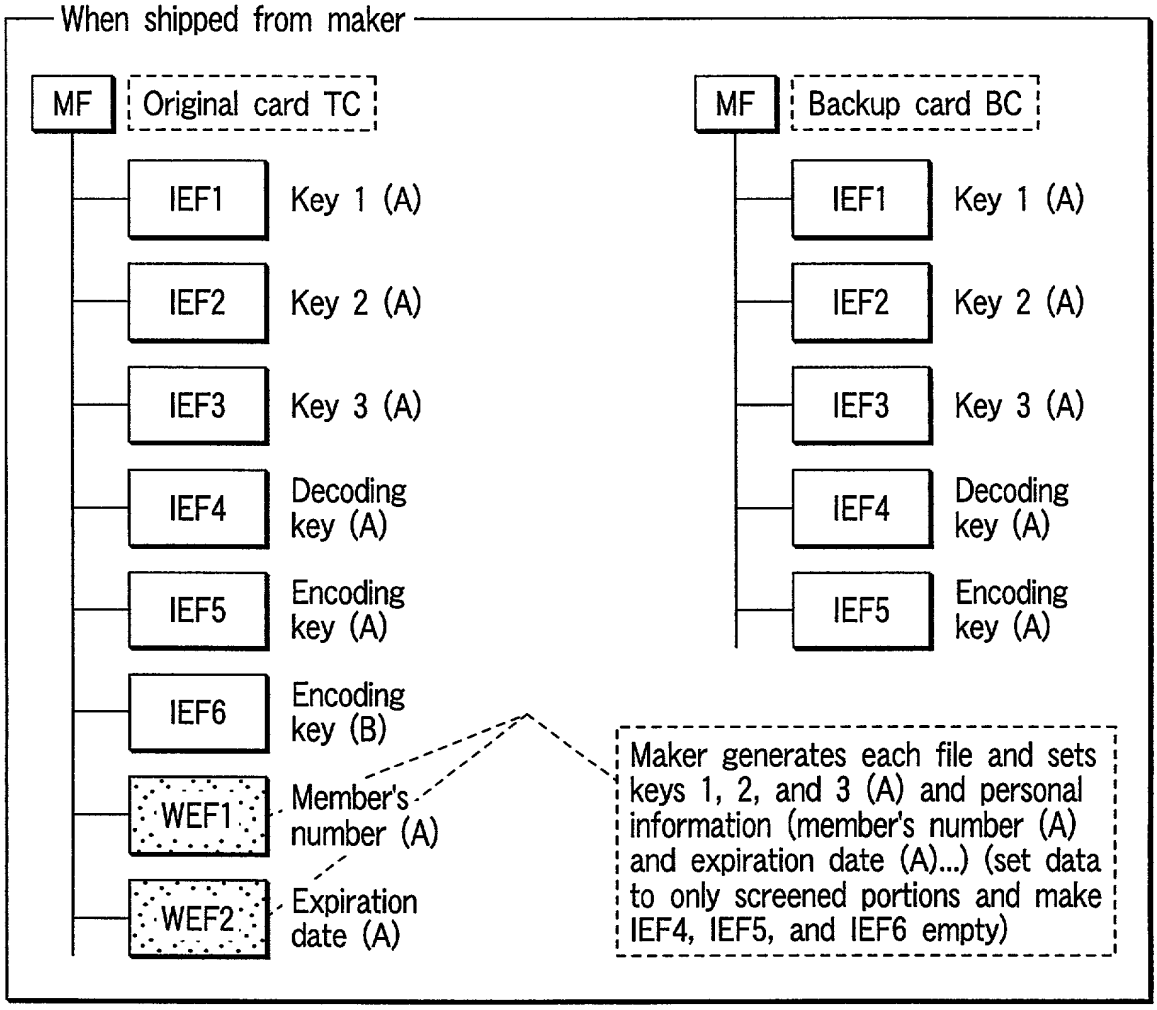

FIG. 22

EP 0 510 648 A2

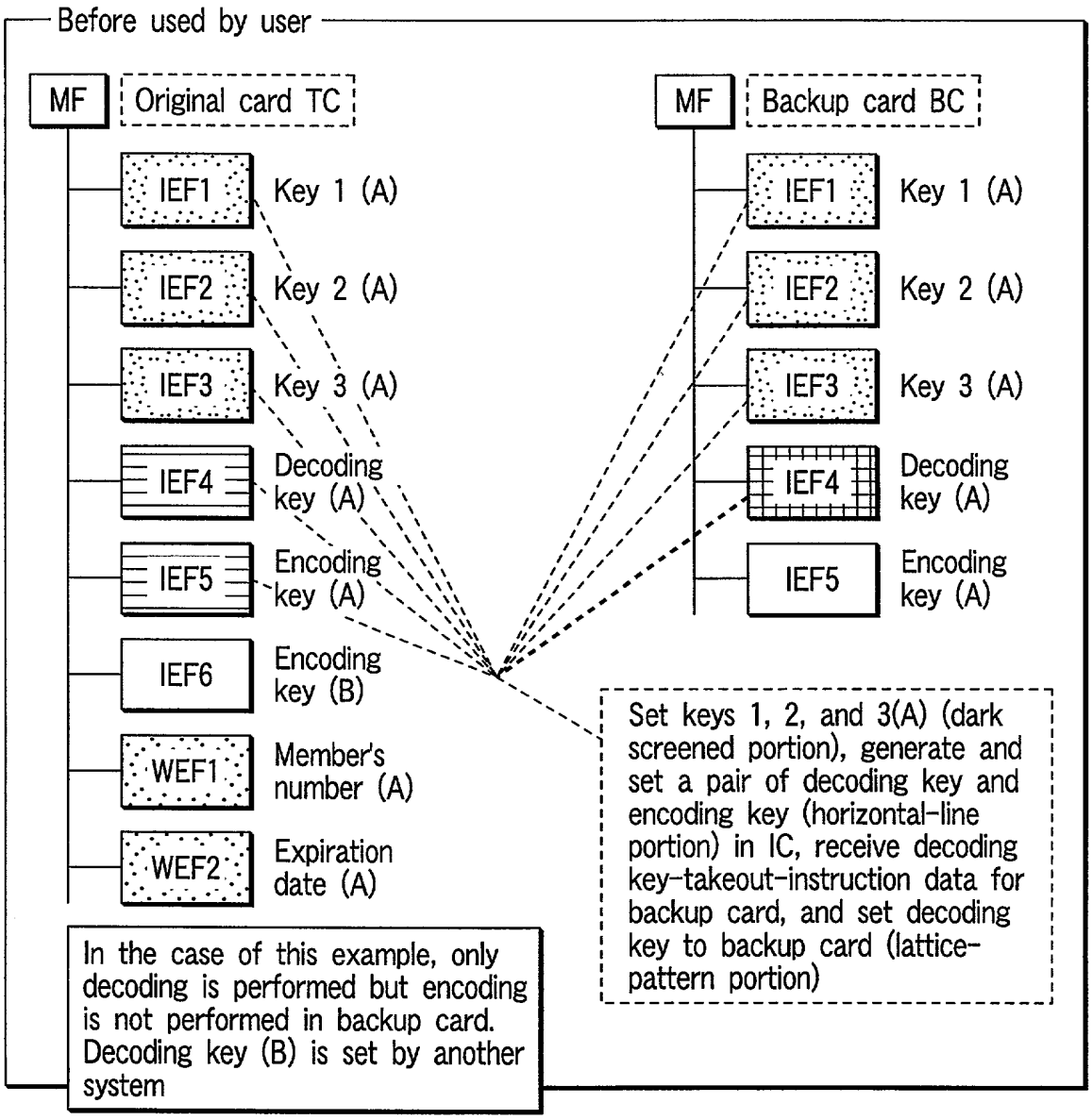

FIG. 23

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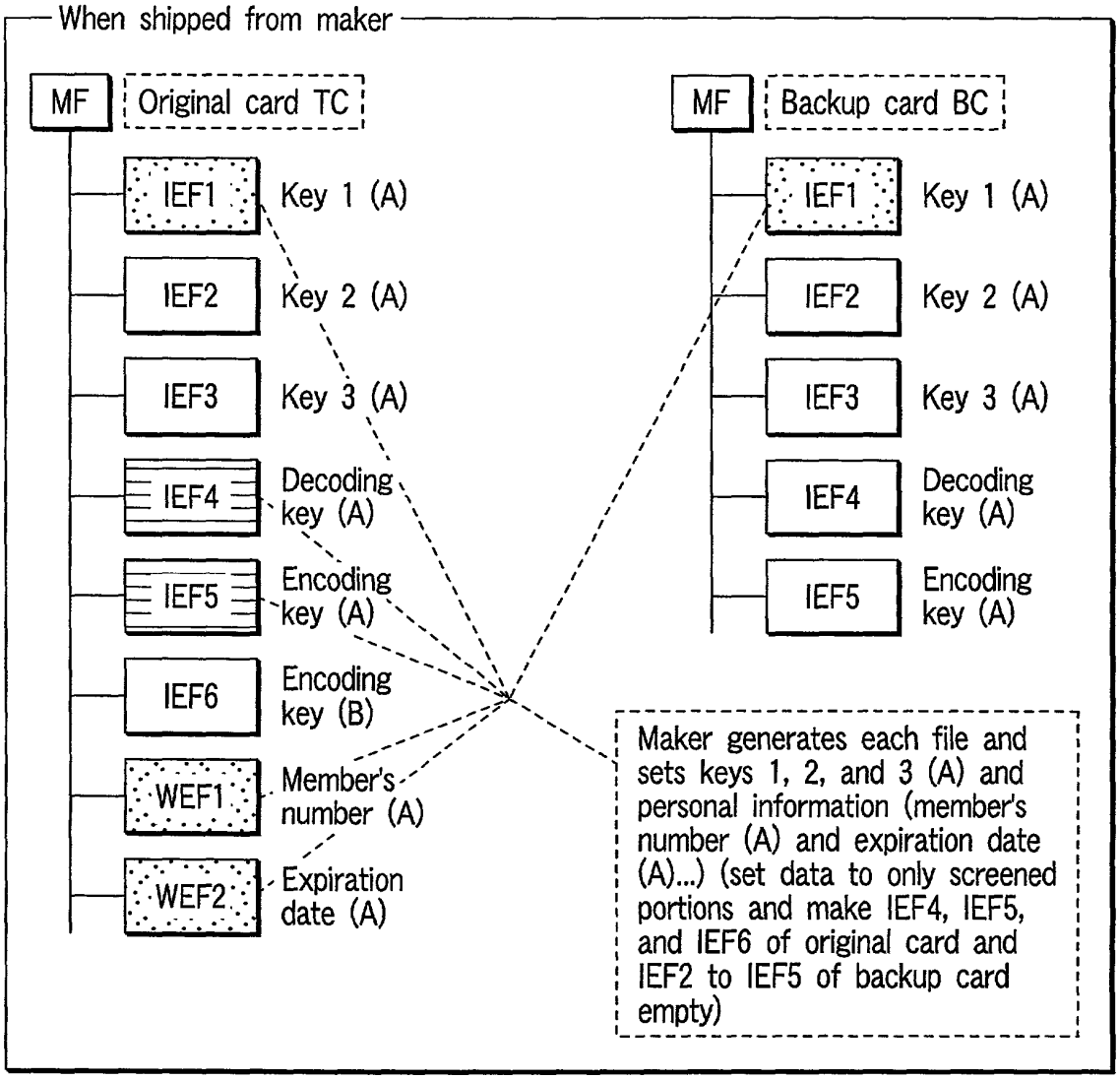

FIG. 24

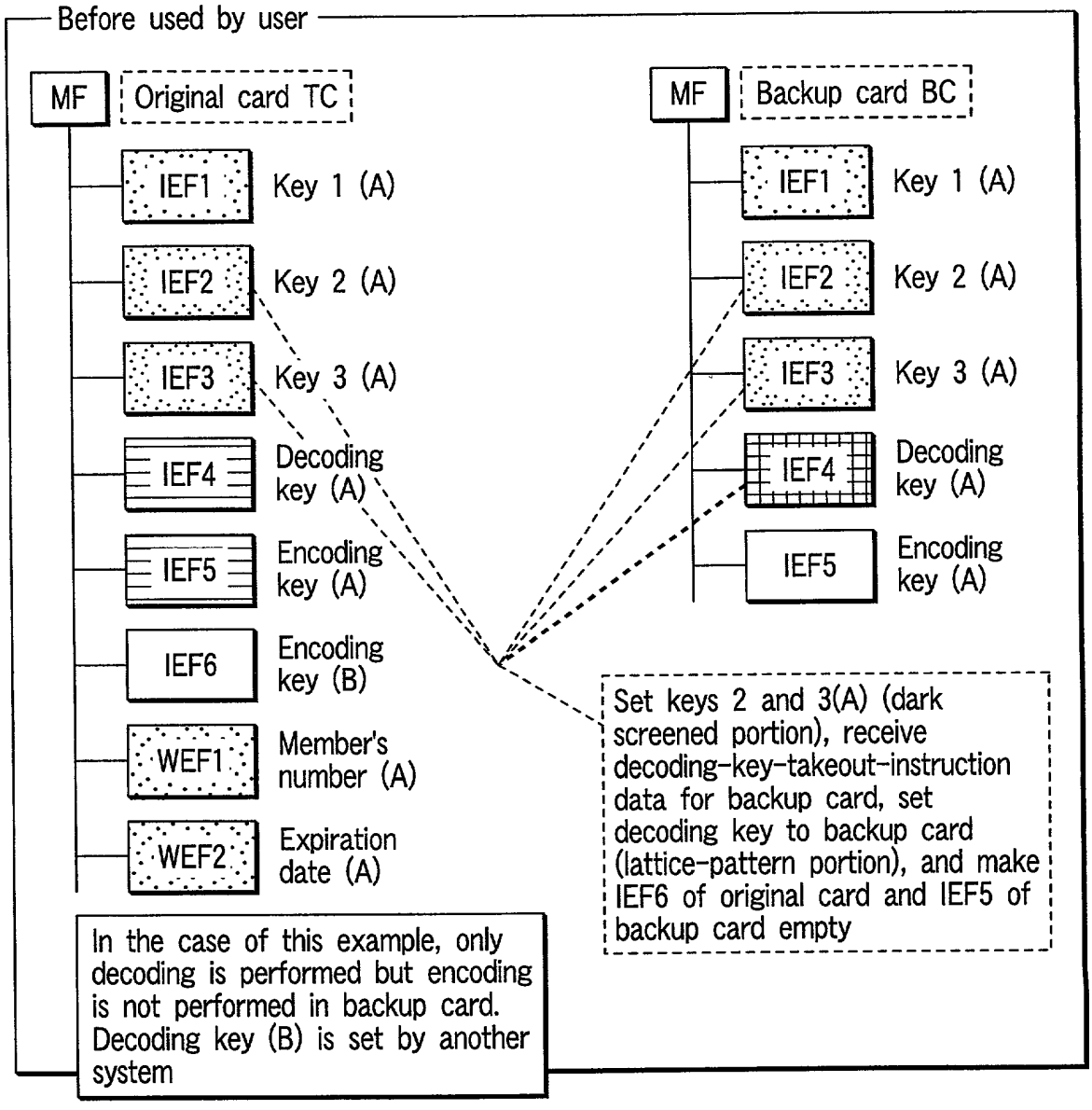
Before used by user
MF
Original card TC
IEF1
Key 1 (A)
IEF2
Key 2 (A)
IEF3
Key 3 (A)
IEF4
Decoding key (A)
IEF5
Encoding key (A)
IEF6
Encoding key (B)
WEF1
Member's number (A)
WEF2
Expiration date (A)
MF
Backup card BC
IEF1
Key 1 (A)
IEF2
Key 2 (A)
IEF3
Key 3 (A)
IEF4
Decoding key (A)
IEF5
Encoding key (A)
Set keys 2 and 3(A) (dark screened portion), receive decoding-key-takeout-instruction data for backup card, set decoding key to backup card (lattice-pattern portion), and make IEF6 of original card and IEF5 of backup card empty
In the case of this example, only decoding is performed but encoding is not performed in backup card. Decoding key (B) is set by another system

FIG. 25

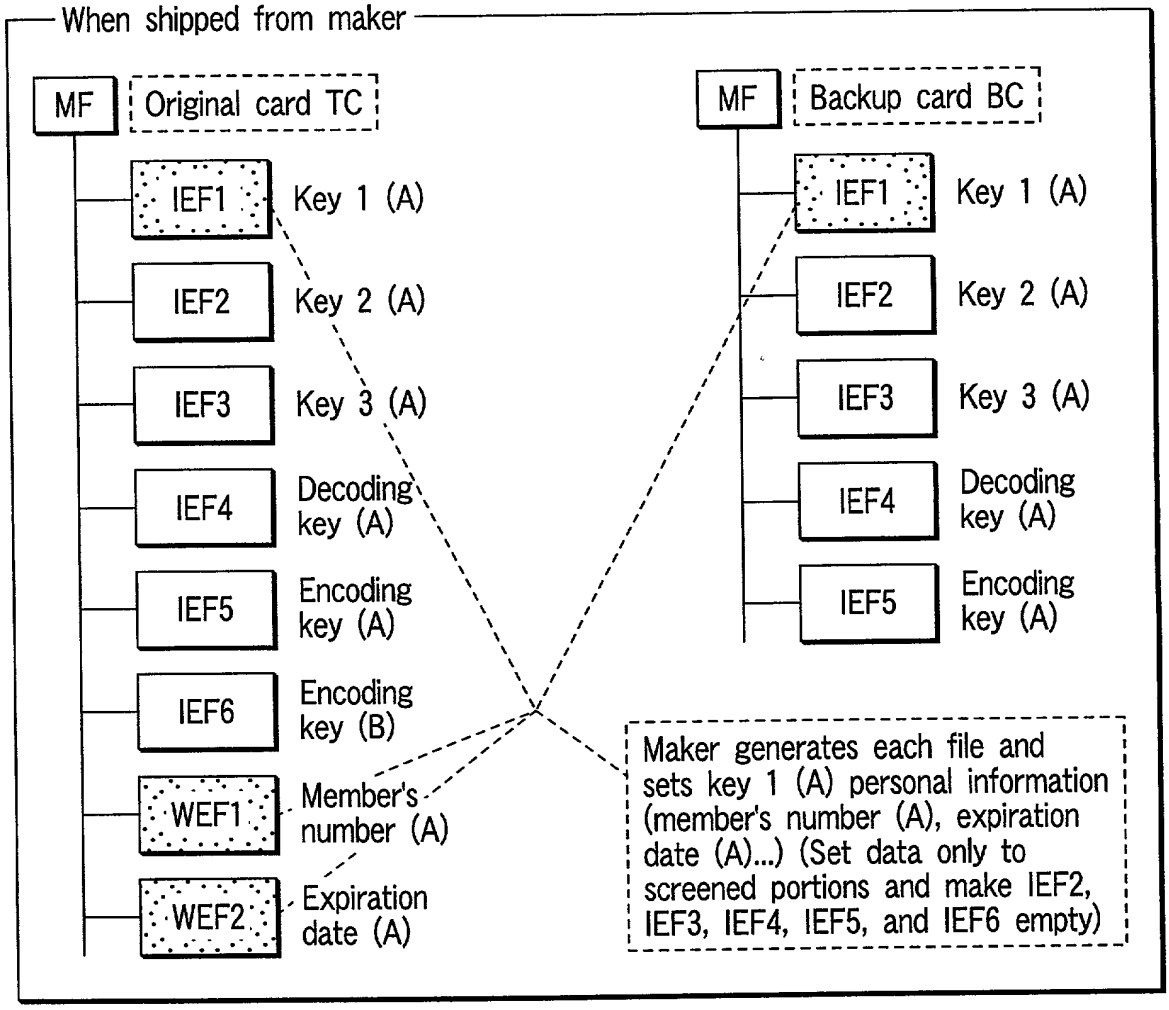
When shipped from maker
MF
Original card TC
IEF1
Key 1 (A)
IEF2
Key 2 (A)
IEF3
Key 3 (A)
IEF4
Decoding key (A)
IEF5
Encoding key (A)
IEF6
Encoding key (B)
WEF1
Member's number (A)
WEF2
Expiration date (A)
MF
Backup card BC
IEF1
Key 1 (A)
IEF2
Key 2 (A)
IEF3
Key 3 (A)
IEF4
Decoding key (A)
IEF5
Encoding key (A)
Maker generates each file and sets key 1 (A) personal information (member's number (A), expiration date (A)...) (Set data only to screened portions and make IEF2, IEF3, IEF4, IEF5, and IEF6 empty)

FIG. 26

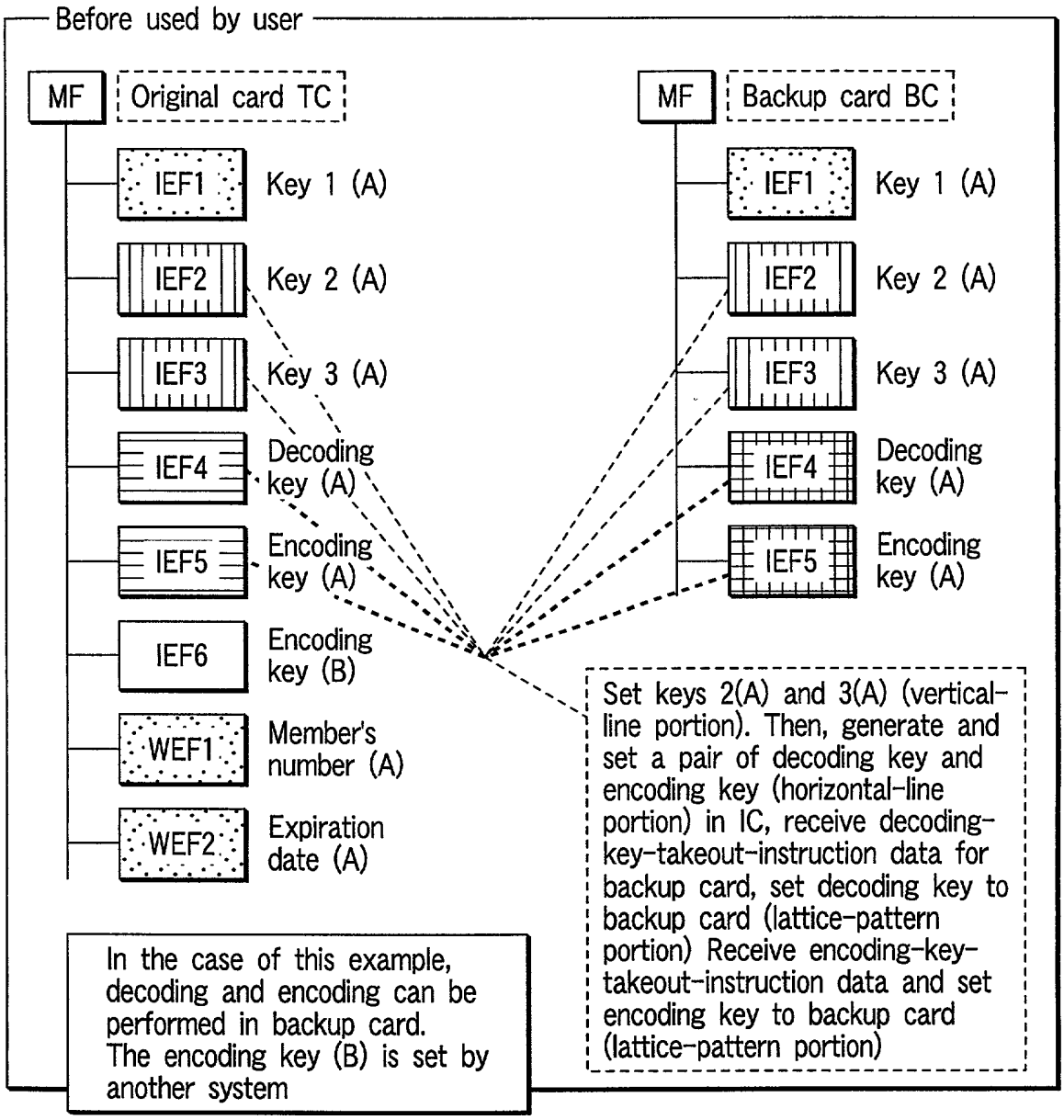
Before used by user
MF
Original card TC
IEF1
Key 1 (A)
IEF2
Key 2 (A)
IEF3
Key 3 (A)
IEF4
Decoding key (A)
IEF5
Encoding key (A)
IEF6
Encoding key (B)
WEF1
Member's number (A)
WEF2
Expiration date (A)
MF
Backup card BC
IEF1
Key 1 (A)
IEF2
Key 2 (A)
IEF3
Key 3 (A)
IEF4
Decoding key (A)
IEF5
Encoding key (A)
Set keys 2(A) and 3(A) (vertical-line portion). Then, generate and set a pair of decoding key and encoding key (horizontal-line portion) in IC, receive decoding-key-takeout-instruction data for backup card, set decoding key to backup card (lattice-pattern portion) Receive encoding-key-takeout-instruction data and set encoding key to backup card (lattice-pattern portion)
In the case of this example, decoding and encoding can be performed in backup card. The encoding key (B) is set by another system

FIG. 27

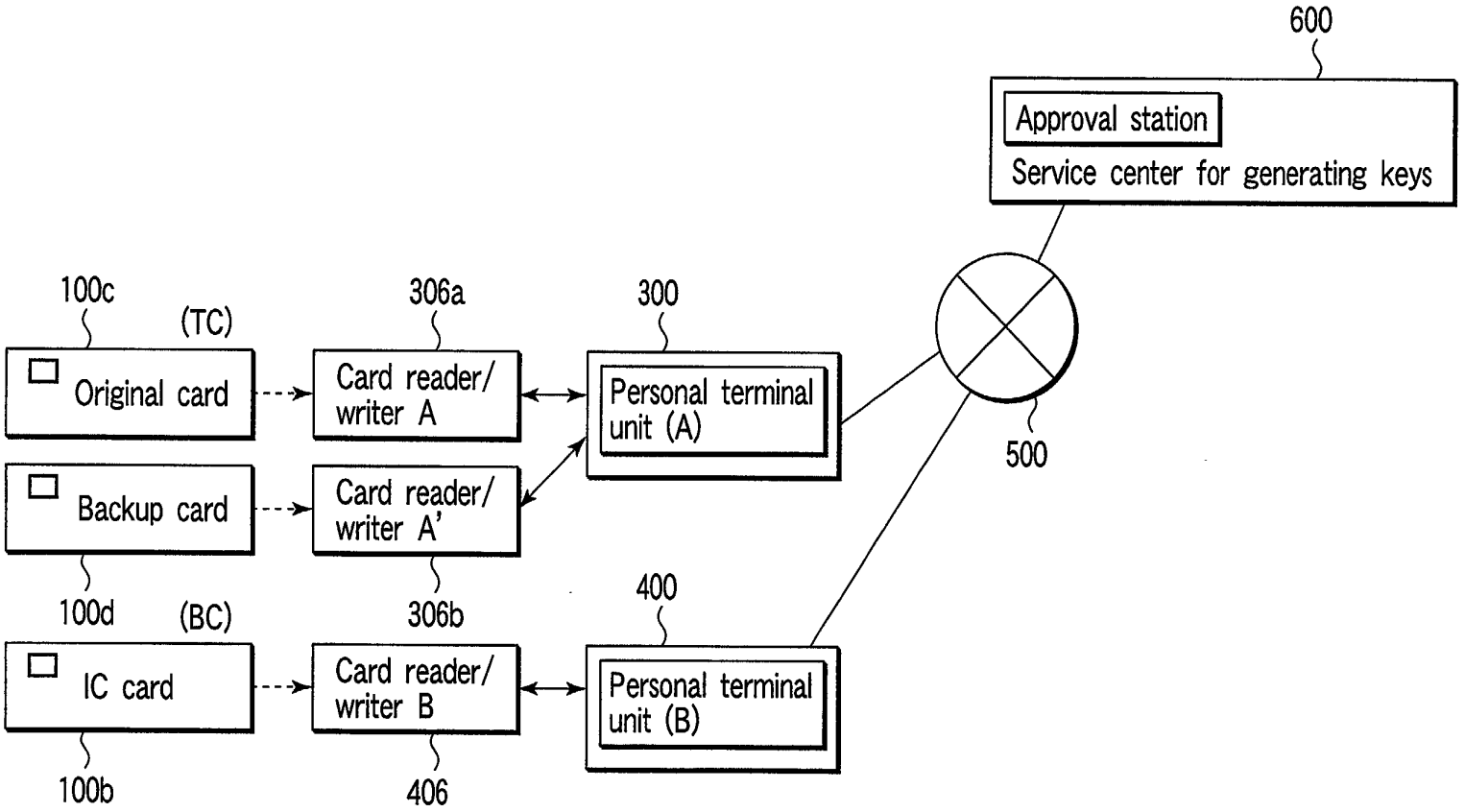
600
Approval station
Service center for generating keys
100c
(TC)
Original card
306a
Card reader/
writer A
300
Personal terminal
unit (A)
500
Backup card
Card reader/
writer A'
100d
(BC)
306b
400
IC card
Card reader/
writer B
Personal terminal
unit (B)
100b
406

FIG. 28

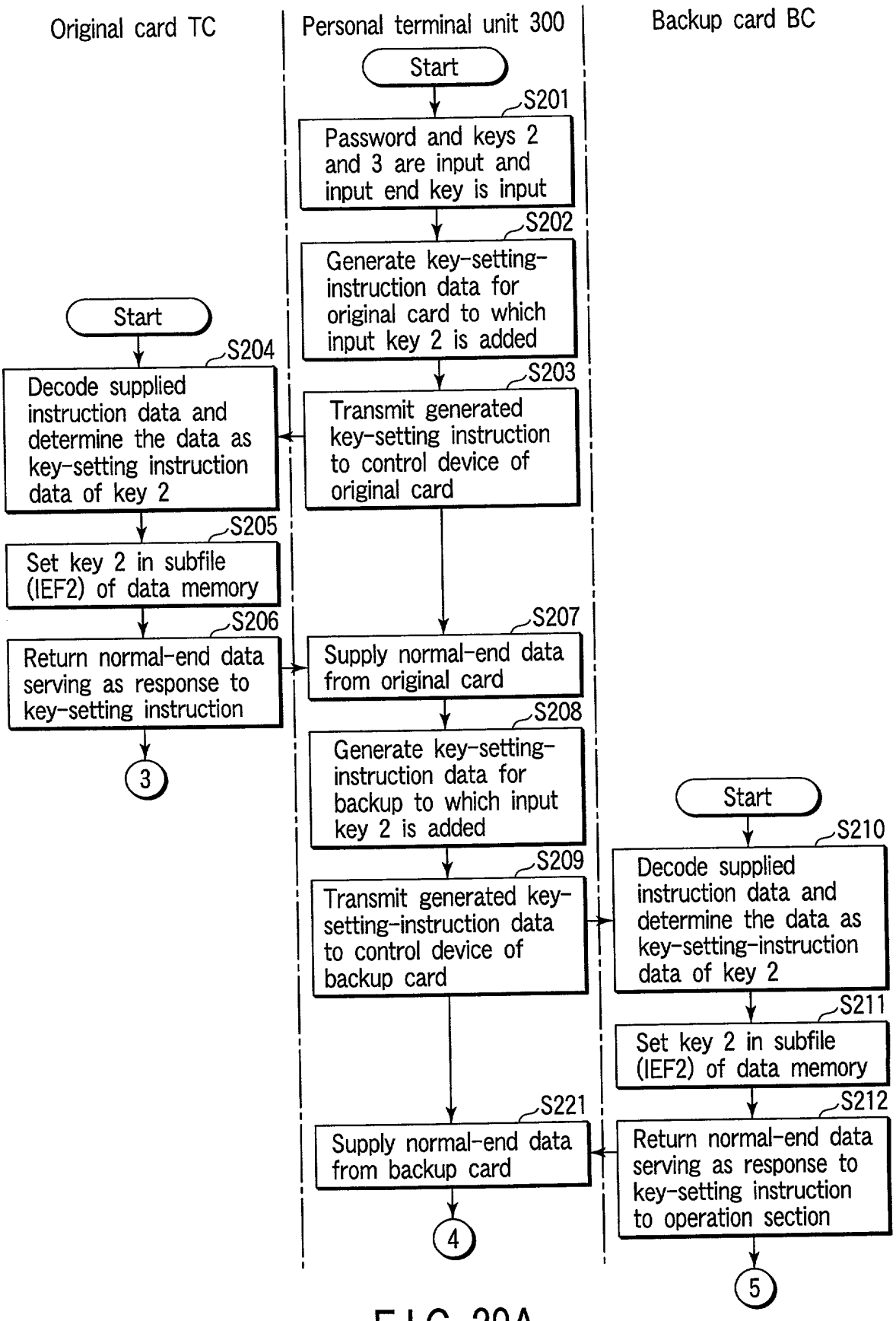
Original card TC
Personal terminal unit 300
Backup card BC
Start
S201
Password and keys 2 and 3 are input and input end key is input
S202
Generate key-setting-instruction data for original card to which input key 2 is added
S203
Transmit generated key-setting instruction to control device of original card
Start
S204
Decode supplied instruction data and determine the data as key-setting instruction data of key 2
S205
Set key 2 in subfile (IEF2) of data memory
S206
Return normal-end data serving as response to key-setting instruction
3
S207
Supply normal-end data from original card
S208
Generate key-setting-instruction data for backup to which input key 2 is added
S209
Transmit generated key-setting-instruction data to control device of backup card
S221
Supply normal-end data from backup card
4
Start
S210
Decode supplied instruction data and determine the data as key-setting-instruction data of key 2
S211
Set key 2 in subfile (IEF2) of data memory
S212
Return normal-end data serving as response to key-setting instruction to operation section
5

FIG. 29A

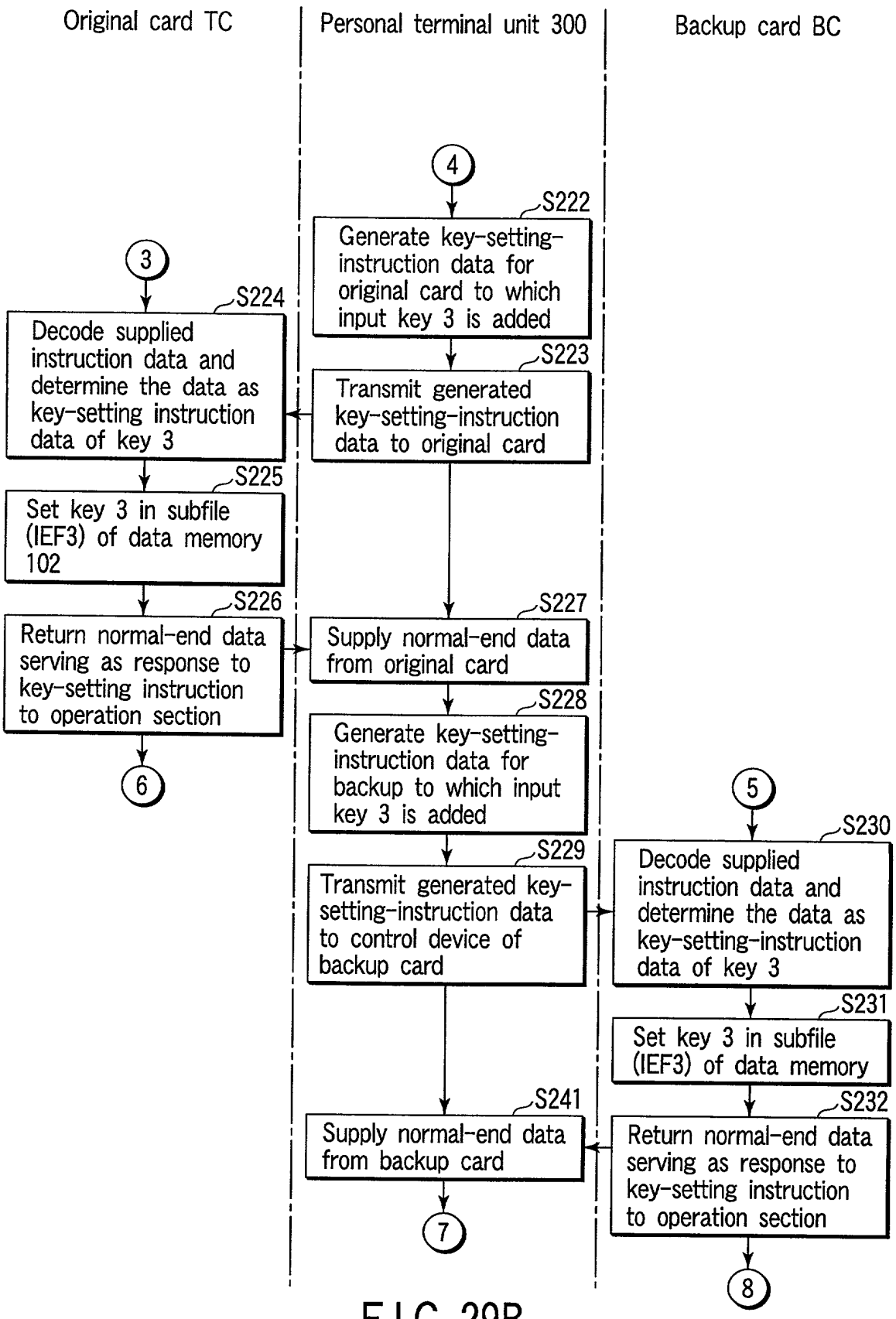
Original card TC
Personal terminal unit 300
Backup card BC
4
S222
Generate key-setting-instruction data for original card to which input key 3 is added
S223
Transmit generated key-setting-instruction data to original card
3
S224
Decode supplied instruction data and determine the data as key-setting instruction data of key 3
S225
Set key 3 in subfile (IEF3) of data memory 102
S226
Return normal-end data serving as response to key-setting instruction to operation section
6
S227
Supply normal-end data from original card
S228
Generate key-setting-instruction data for backup to which input key 3 is added
S229
Transmit generated key-setting-instruction data to control device of backup card
5
S230
Decode supplied instruction data and determine the data as key-setting-instruction data of key 3
S231
Set key 3 in subfile (IEF3) of data memory
S232
Return normal-end data serving as response to key-setting instruction to operation section
8
S241
Supply normal-end data from backup card
7

FIG. 29B

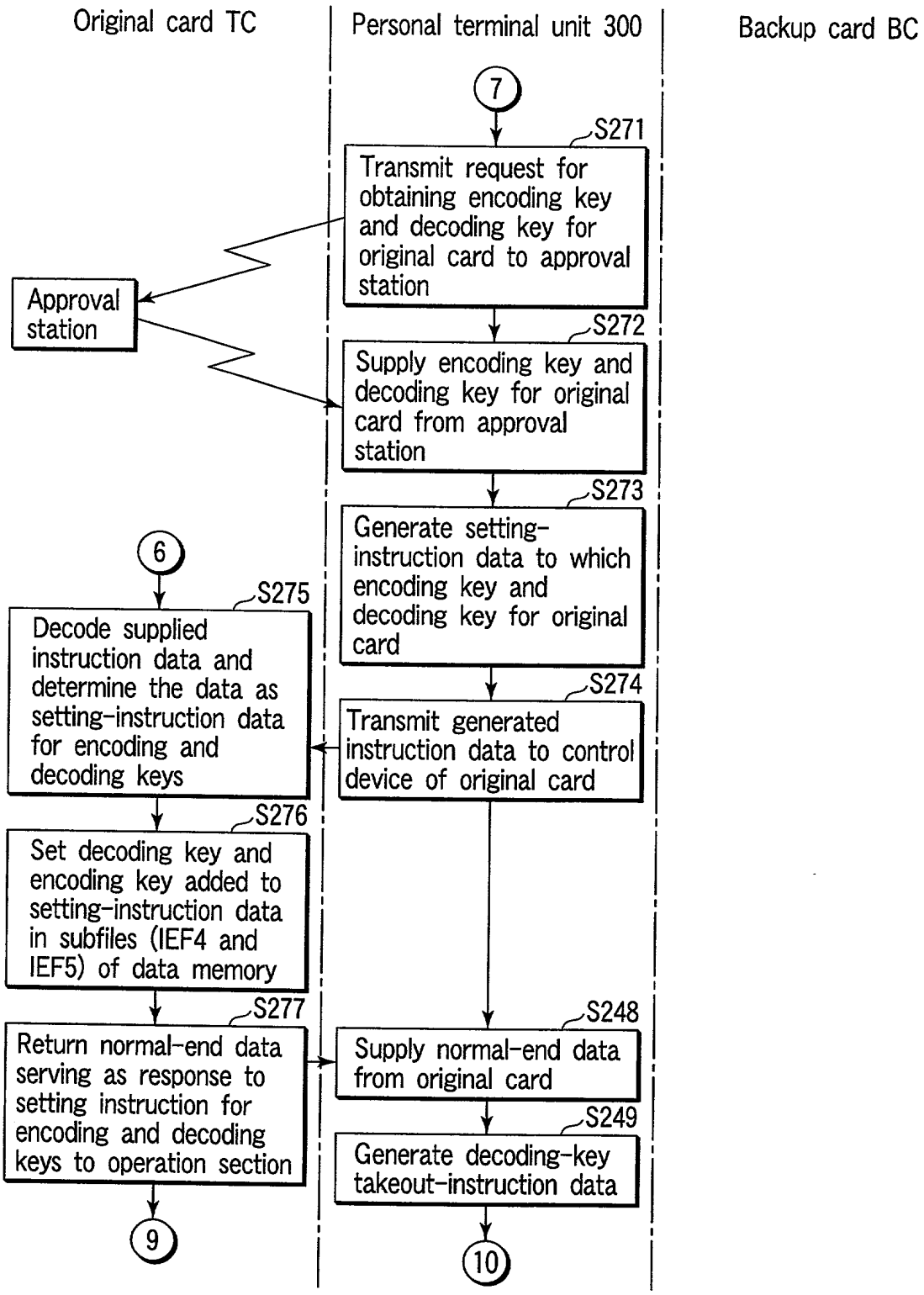
Original card TC
Personal terminal unit 300
Backup card BC
7
S271
Transmit request for obtaining encoding key and decoding key for original card to approval station
Approval station
S272
Supply encoding key and decoding key for original card from approval station
S273
Generate setting-instruction data to which encoding key and decoding key for original card
6
S275
Decode supplied instruction data and determine the data as setting-instruction data for encoding and decoding keys
S274
Transmit generated instruction data to control device of original card
S276
Set decoding key and encoding key added to setting-instruction data in subfiles (IEF4 and IEF5) of data memory
S277
Return normal-end data serving as response to setting instruction for encoding and decoding keys to operation section
S248
Supply normal-end data from original card
S249
Generate decoding-key takeout-instruction data
9
10

FIG. 29C

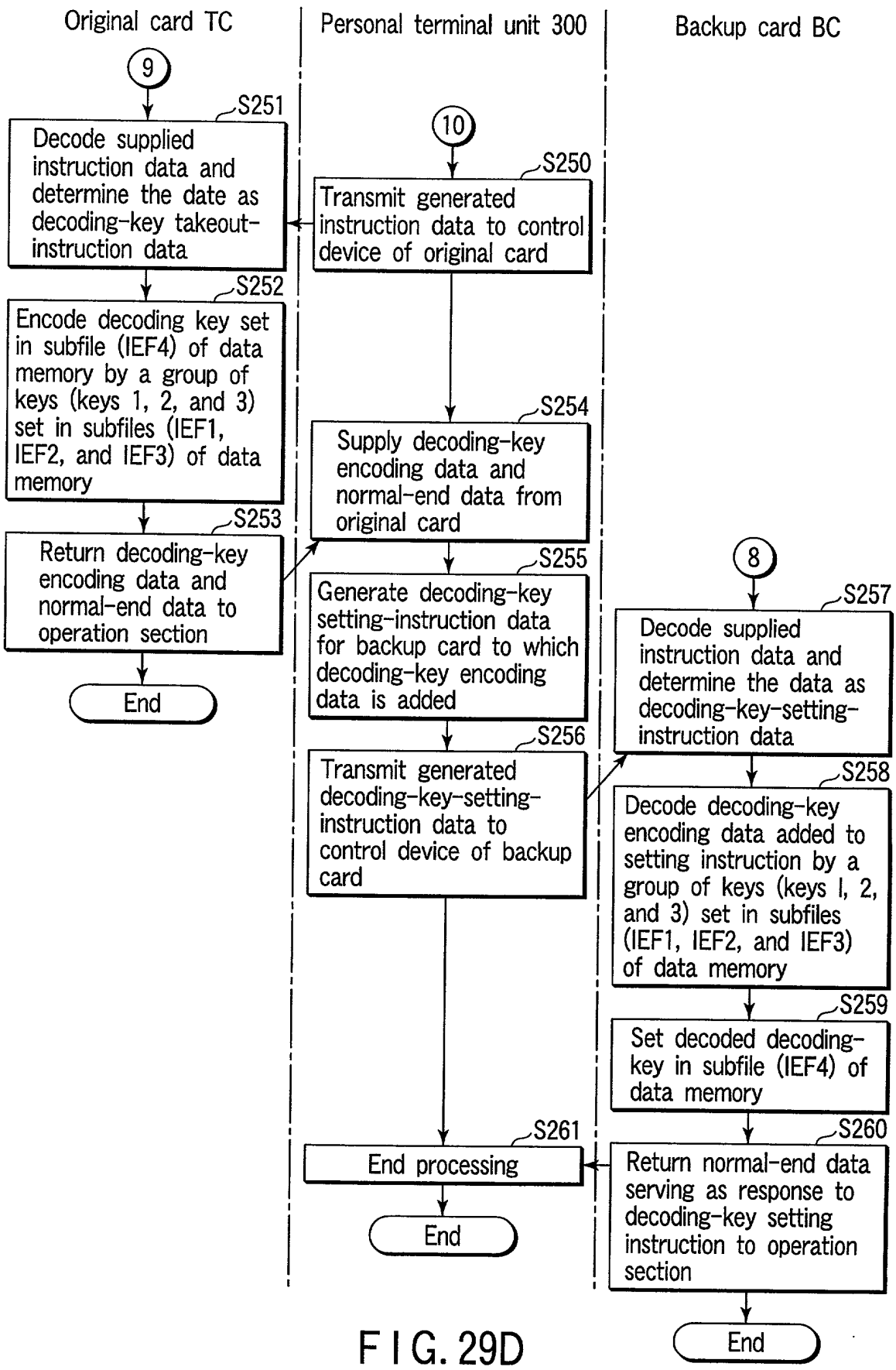
Original card TC
Personal terminal unit 300
Backup card BC
9
S251
Decode supplied instruction data and determine the date as decoding-key takeout-instruction data
S252
Encode decoding key set in subfile (IEF4) of data memory by a group of keys (keys 1, 2, and 3) set in subfiles (IEF1, IEF2, and IEF3) of data memory
S253
Return decoding-key encoding data and normal-end data to operation section
End
10
S250
Transmit generated instruction data to control device of original card
S254
Supply decoding-key encoding data and normal-end data from original card
S255
Generate decoding-key setting-instruction data for backup card to which decoding-key encoding data is added
S256
Transmit generated decoding-key-setting-instruction data to control device of backup card
S261
End processing
End
8
S257
Decode supplied instruction data and determine the data as decoding-key-setting-instruction data
S258
Decode decoding-key encoding data added to setting instruction by a group of keys (keys 1, 2, and 3) set in subfiles (IEF1, IEF2, and IEF3) of data memory
S259
Set decoded decoding-key in subfile (IEF4) of data memory
S260
Return normal-end data serving as response to decoding-key setting instruction to operation section
End

FIG. 29D

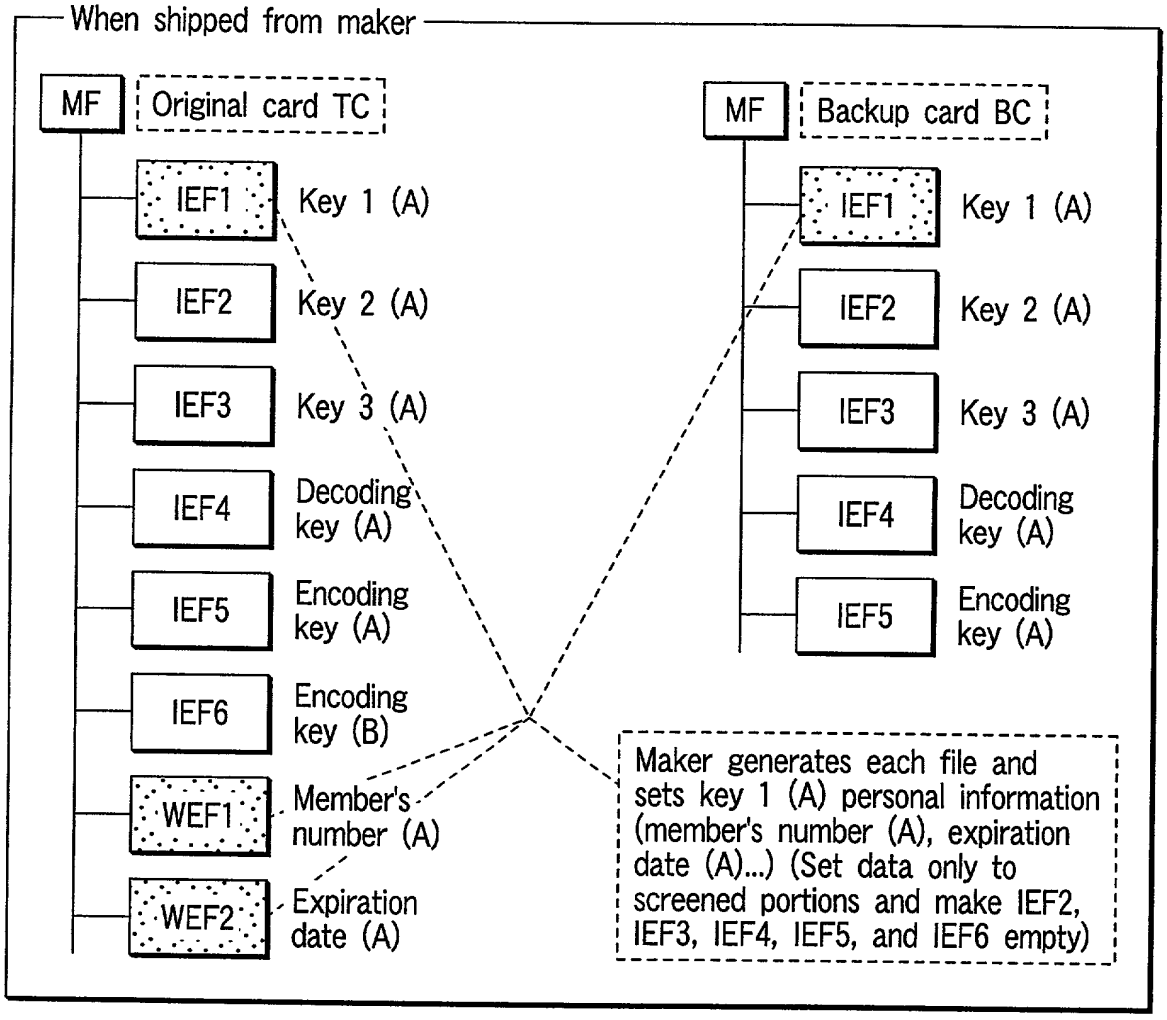
When shipped from maker
MF
Original card TC
IEF1
Key 1 (A)
IEF2
Key 2 (A)
IEF3
Key 3 (A)
IEF4
Decoding key (A)
IEF5
Encoding key (A)
IEF6
Encoding key (B)
WEF1
Member's number (A)
WEF2
Expiration date (A)
MF
Backup card BC
IEF1
Key 1 (A)
IEF2
Key 2 (A)
IEF3
Key 3 (A)
IEF4
Decoding key (A)
IEF5
Encoding key (A)
Maker generates each file and sets key 1 (A) personal information (member's number (A), expiration date (A)...) (Set data only to screened portions and make IEF2, IEF3, IEF4, IEF5, and IEF6 empty)

FIG. 30

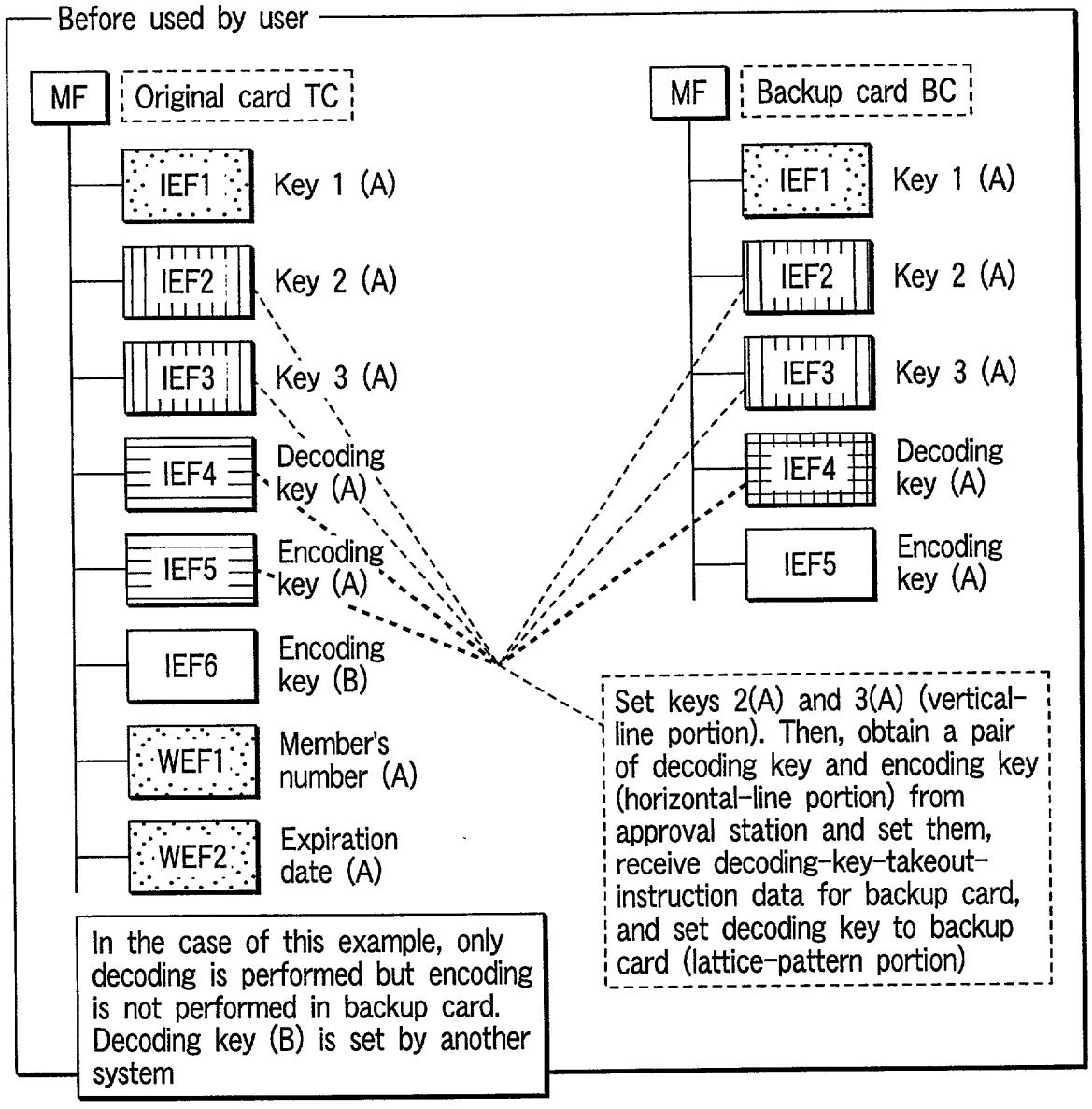
Before used by user
MF
Original card TC
IEF1
Key 1 (A)
IEF2
Key 2 (A)
IEF3
Key 3 (A)
IEF4
Decoding key (A)
IEF5
Encoding key (A)
IEF6
Encoding key (B)
WEF1
Member's number (A)
WEF2
Expiration date (A)
MF
Backup card BC
IEF1
Key 1 (A)
IEF2
Key 2 (A)
IEF3
Key 3 (A)
IEF4
Decoding key (A)
IEF5
Encoding key (A)
Set keys 2(A) and 3(A) (vertical-line portion). Then, obtain a pair of decoding key and encoding key (horizontal-line portion) from approval station and set them, receive decoding-key-takeout-instruction data for backup card, and set decoding key to backup card (lattice-pattern portion)
In the case of this example, only decoding is performed but encoding is not performed in backup card. Decoding key (B) is set by another system

FIG. 31